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SOME BRYOZOA FROM THE BRAZILIAN COAST

ERNESTO MARCUS *

The present collection was for the most part dredged South of Victoria, Espirito Santo, in 35 m. A first selection of the same hauling is published in *Arquivos do Museu Nacional,* Rio de Janeiro (1949). Only the species not represented in the first material are mentioned here together with some, the new samples of which make supplementary notes possible. Six species from the littoral of Rio and São Paulo are added.

Mrs. Eveline du Bois-Reymond Marcus has drawn the figures and taken part in the morphological study.

LIST OF LOCALITIES AND SPECIES

South of Victoria, Espirito Santo (Lat. 20° 33'S., long. 40° 14'W.). 35 m.

Pyripora audens, n. sp.
Pyrulella mesitis, n. sp.
Smittipora acutirostris (C. & B.).
Steganoporella connexa Harm.
Steganoporella transversalis C. & B.
Steganoporella evelinae, n. sp.
Labioporella dipla, n. sp.
Micropora coriacea (Johnst.).
Mollia elongata C. & B.
Trypostega venusta (Norm.); vastly distributed in tropical and warmer temperate seas; already known from the coast of Espirito Santo (CANU & BASSLER, 1928a, p. 76), and Santos (MARCUS, 1938, p. 35).
Coleopora corderoi, n. sp.
Utinga castanea (Bsk.).
Exochella longirostris Jull.; a Southern species, hitherto not recorded North of Santos, (MARCUS, 1937, p. 82).
Escharoides martae Marc.
Escharoides numma n. sp.

* Department of Zoology, Faculty of Philosophy, Sciences, &c., of the University of São Paulo, Brazil. P. O. B. 105-B.

Adeona violacea (Johnst.).
Adeona bipartita C. & B.
Hippaliosina imperfecta (C. & B.).
Mastigophora parviseta C. & B.
Holoporella carvalhoi Marc., hitherto only known from the littoral of São Paulo (MARCUS 1939, p. 158).

Shallow water of the Ilha do Francês (Lat. 20º 54' 10" S., long 40º 45' W.).

Pedicellina nannoda Marc.; hitherto only known from the bay of Santos (MARCUS 1937, p. 14).
Beania australis Bsk.; a Magellanic species formerly found in the bay of Santos (MARCUS 1937, p. 63).
Euteleia evelinae Marc.; hitherto only known from the littoral of São Paulo (MARCUS 1939, p. 33).
Siniopelta costazii (Aud.); vastly distributed, but from the American side of the Atlantic only recorded for Santos (MARCUS 1937, p. 121) and Porto Rico (OSBURN 1940, p. 461).
Alcyonidium polyoum (Hass.); with exception of the Antarctic region world-wide distributed; from the Western tropical Atlantic only recorded for Santos (MARCUS 1937, p. 125) and the West Indian region (OSBURN 1947, p. 6).

Littoral of Rio de Janeiro.

Barentsia capitata Calv.
Beania intermedia (Heks.); vastly distributed in warmer waters and the Australian region; Santos (MARCUS 1937, p. 61); Pernambuco id. 1939, p. 113); West-India (OSBURN 1940, p. 398; 1947, p. 25).
Bugula flabellata (J. V. Thomps.); widely distributed in the Atlantic; California; West-India (OSBURN 1940, p. 391; 1947, p. 23); Santos (MARCUS 1938, p. 27; CORREA 1948).
Amathia distans Bsk.

Littoral of São Paulo, São Sebastião, 100 km. East of Santos.

Steganoporella transversalis C. & B.
Bugula carvalhoi, n. sp.

BARENTSIA CAPITATA Calv.

Figure 1

Barentsia capitata Calvet 1904, p. 59.
Barentsia capitata Calvet 1904a, p. 41. t. 3: f. 2.

Two small fragments of colonies creeping on *Amathia distans* Bsk. together with *Pedicellina nannoda* Marc. The individuals are

of small size, 0,83-1,22 mm. in length. The calyx is oblique, provided with 16-20 tentacles and occupies about one third (0,31-0,39 mm.) of the total length. The thin part of stalk is a little longer (0,31-0,525 mm.), and the muscular base a little shorter than one third (0,21-0,38) mm.). The thin portion of the stalk is 0,07 mm. in diameter, separated from the muscular base by a diaphragm, and covered with a thin, colourless cuticle without pores or spines. It has no secondary muscular joints. The annular folds of the distal part of the stalk described by CALVET are not developed in the present material.

The creeping stolon is composed of alternating segments, one with stalk and calyx (the fertile internodes of CALVET), and one barren segment (sterile internodes). This arrangement is typical of the Pedicellinidae (HARMER 1915, p. 31; CORI 1930, p. 17). CALVET says that the fertile segments of *B. capitata* bear several, at least 2 zoids; he evidently observed a region of the colony where buds were profusely developed and the barren intervening segments were not yet separated as they are in the definitive condition. As only the fertile segments can give rise to lateral branches of the stolo, there are frequently several developing individuals united around the base of an older one. The present colonies are not as densely ramified as the original ones, but the short and wide, soft stalk is so characteristic that the classification seems quite probable.

Occurrence: Littoral of Rio de Janeiro.

Distribution: South Georgia, on *Menipea patagonica* Bsk.

Discussion of *Barentsia capitata* Calv. — As the individuals of the present material are smaller than those drawn by CALVET, that are 2-3 mm. long, and do not show the annulated distal part of the stalk, these differences must be discussed. The total length of the "Siboga"-specimens of *B. discreta* varies between 1,584 and 3 mm. In *B. laxa* Kirkp. MARY ROGICK measured 9,867 mm. as maximum and 1,024 mm. as minimum total length (1948, p. 130). The original material of *B. laxa* Kirkpatrick (1890, p. 624) shows only traces (HARMER 1915, p. 33) of the numerous rings that are distinct in the "Siboga"-material (l. c., t. 2: f. 11). The small size and the not annulated distal region of the stalk are not sufficient for specific separation of the present specimens from *B. capitata.* Also the geographic question must be considered, if specimens from Rio de Janeiro are identified with a species found South of the Antarctic convergence (HASTINGS 1943, f. 59) and on a Cheilostome that is not known farther North than the Magellanic region and the Patagonian shelf (ibid., p. 333). Species like *Pedicellina hirsuta* Jull. (MARCUS 1941, p. 12), *Aetea ligulata* Bsk. (id. 1937, p. 30) and *Exochella longirostris* Jull. (ibid., p. 82), show similar but not so extremely different localities in their geographic distribution. I agree with BORG (1944, p. 15) "that when species from distant areas are identified with one another, reliable grounds for

this identification and figures of the species in question should be given". I think that these are presented; but in any case I have further compared the present material with all other species of the genus and indicated for each of them a character that differs from the present material.

B. gracilis (M. Sars 1835, p. 6) is a small species. It was described as having 20 tentacles, but the true number seemns to be 12 (Cori 1936, p. 114) to 14 (Harmer 1915, p. 28). The stalk is only 0,03 mm. in diameter. *Pedicellina gracilis* var. *nodosa* Lomas (1886, p. 190), later considered as separate species of *Ascopodaria* and *Gonypodaria,* is a synonym of *B. gracilis* (Harmer, l. c.). Another synonym of *B. gracilis* is *Pedicellina belgica* Beneden (1845, p. 23).

B. bulbosa Hincks (1880b, p. 285). The stalk produces lateral buds.

B. discreta (Busk 1886, p. 29). The stalk is covered with a thick cuticle, the inner layer of which is perforated with numerous pores. *B. misakiensis* (Oka 1890; see Harmer 1915, p. 29; Waters 1918, p. 42) is a synonym of *B. discreta*. The same probably holds true for *B. timida* Verrill (1900, p. 594) after Osburn (1914, p. 185); in his later papers Osburn (1940, p. 327; 1944, p. 9) gives this synonymy as certain.

B. benedeni (Foettinger 1887, p. 301). Stalk with muscular joints and with lateral buds.

B. major Hincks (1888, p. 226). Calyx supported by a relatively long, fleshy stalk (pedicellium Jullien & Calvet 1903, p. 26), separated from the inner annulated main part, the pedicel (Hincks; pediculium Jullien & Calvet, l. c.).

B. australis (Jullien 1888, p. 13). After Waters (1904, p. 99; 1905, p. 230) a synonym of *B. discreta* (Bsk.).

B. macropus (Ehlers 1890, p. 7, 143). Stalk with a porous cuticle. The species is nearly allied to *B. discreta* (Harmer 1915, p. 32).

B. laxa Kirkpatrick (1890, p. 624). The calyx-supporting part of the stalk is long, soft and extremely flexible (see Rogick 1948, f. 1, 12).

B. ramosa (Robertson 1900, p. 327). The stalk is jointed and bears lateral buds.

B. variarticulata Andersson (1902, p. 557). Stalk with lateral buds. Probably a synonym of *B. bulbosa* Hcks.

B. stiria Jullien & Calvet (1903, p. 26). Has 12 tentacles and the calyx-bearing part of the stalk is half as long as the calyx.

B. berenice Jullien & Calvet (1903, p. 26). The stalk is brown, chitinous; the number of tentacles is 12.

B. elongata Jullien & Calvet (1903, p. 27). The thin, yellow stalk is annulated. After Calvet (1904a, p. 41) and Osburn (1933, p. 7) a synonym of *B. major* Hcks.

B. variabilis Calvet (1904a, p. 40). As in *B. major* the calyx is supported by a long, fleshy stalk.

B. geniculata Harmer (1915, p. 33). Stalk interrupted by two or three muscular joints.

B. parva (O'Donoghue 1923, p. 148). Full grown stalks have a second muscular joint (muselium Jullien & Calvet 1903, p. 26) about half way along the stalk.

B. robusta O'Donoghue (1924, p. 21). A very large species: the muscular base of the stalk rounded at both ends, and 1 mm. or more in length. The stalk tapers distally, its narrowest region being just below the calyx.

B. kovalevskii (Nassonov 1926, p. 1). Stalk with muscular joints and lateral buds.

PYRIPORA AUDENS, n. sp.

Figures 2-3

Several colonies incrusting foliaceous algae. The zoids are pure white in two zoaria that are younger than the others; in the older ones the inter-zooecial furrows are spotted with rust-coloured spots rather too regularly distributed for being patches of sediments. But as this colour also occurs in other species from the same dredging, it may be foreign matter. The zoids are 0,4-0,42 mm. in length and 0,2-0,25 mm. in breadth. They grow in single series. One or two new series may originate near the distal end of a zoid. They form an angle of about 60° with the main direction. There are small bridges between the series. The outlines of the zoids are rhombic. The distal half of the zoid is rounder and broader than the proximal one. The former is for the most part occupied by the proximally widened aperture; the latter is covered by the smooth gymnocyst. The aperture shows a tuberculate descending cryptocyst that is broadest proximally. From the inner surface of the cryptocyst a short and branched process projects into the body-cavity and is partly seen in the opesia. The boundary between gymnocyst and cryptocyst is the highest point of the front-wall.

The border of the opercular valve is fortified by a semicircular brown sclerite below which a vestibular arch appears. The proximal end of the zoid is occupied by a chitinous, not calcified belt that falicitates the flexibility of the colony on the algae. Each lateral wall has 2-3 open pores. Sometimes these remain unaltered, in other cases they form dwarf-zooecia without polypides (kenozoids), or common zoids or inter-zooecial bridges. One median and two lateral uncalcified areas of the basal wall are similar to those of *Conopeum reticulum* (WATERS 1898, p. 679; MARCUS 1938, p. 14).

Occurrence: Coast of Espirito Santo, 35 m.

Discussion of *Pyripora audens*. — The species of *Pyripora* described by P. H. MACGILLIVRAY (1885, pp. 23-24) were partially put in the synonymy of *Electra* (LEVINSEN 1909, p. 146). This synonymy refers probably to *Pyripora catenularia* (Jameson), that is JAMESON'S species for MACGILLIVRAY, while it is *Electra crustulenta* (Pall.) for LEVINSEN. DONS (1941, p. 55) applies *fossaria* Heks., because *crustulenta* has been used for a fossil species "imidlertid", viz. in the interval of time between PALLAS (1766)

and the re-validation of *crustulenta* by BORG (1931). Evidently DONS thinks of *Cellepora crustulenta* Goldfuss (1827), later on *Membranipora crustulenta* (LEVINSEN 1925, p. 346), better *Floridina crustulenta* (CANU & BASSLER 1920, p. 220). As *Eschara crustulenta* Pall. comes under *Electra*, no modification is necessary for the cretaceous species. But even if both species were called *Membranipora*, it is clear that the newer one must be re-named, and *fossaria* continues a synonym of *crustulenta* as established by BORG (1931, p. 11).

It is an open question whether *crustulenta* and *catenularia* should be put in the same genus *Electra* Lmx., as defined by LEVINSEN (1909, p. 146) and HARMER (1926, p. 206). The single spine on the proximal side of the opesia mentioned by HARMER is generally missing in *crustulenta* and frequently in *tenella* (Hcks.) and *bellula* (Hcks.) that are certainly *Electra*. But on the other hand the cryptocyst of the species of the "*Pyripora*-group of *Membranipora*" (WATERS 1898, p. 664) is more developed than would correspond to HARMER's text "wanting or barely indicated". Therefore it seems better to preserve *Pyripora* d'Orb., as CALVET (1931, p. 50) did.

From CANU & BASSLER's diagnosis of *Pyripora* (1920, p. 78) must be suppressed: "operculum calcified" and "cells not continuous laterally". It is the operculum of *Electra crustulenta* (Pall.) that is calcified and not that of *Pyripora catenularia* (James.). The zoids of the latter are occasionally (HINCKS 1880, t. 17: f. 2) and those of *P. polita* (Hcks.) are usually aggregated (P. H. MACGILLIVRAY, l. c.). On the other hand a loose grouth occurs in *E. crustulenta* var. *arctica* (WATERS 1900, p. 59, t. 8: f. 3; OSBURN 1933, t. 14: f. 4: under the name of *catenularia*).

Species with ovicells (WATERS 1882, p. 262) do not belong to *Pyripora*. Therefore I can not unite the present species with the pliocene *pedunculata* Manz., although the material from Ceylon that HINCKS (1880a, p. 377) called *pedunculata* is very similar. The globose, smooth and imperforate ovicells of MANZONI's tertiary species do not occur in that of HINKS. THORNELLY (1912, p. 143) however mentions ovicells in a recent species from the Indic that she called *pedunculata* Manz. It can not be judged whether her few zooecia are identical with HINCKS' material, but it is not probable, because HINCKS had a rich material without any ovicells. I agree with CANU (1911, p. 234) who separates *pedunculata* Manz., *pedunculata* Hcks. and *crassa* (P. H. MACGILLIVRAY 1863, p. 130). As already HINCKS (1891, p. 93) said, *P. crassa* differs by the thick projection from the lower margin of the aperture from *pedunculata* Hcks. *P. catenularia* has an oval aperture, the length of which is twice the breadth, its cryptocyst is narrower than that of *audens* and has not the inwardly directed process.

PYRULELLA MESITIS, n. sp.

Figure 4

A small colony without ovicells and with regular ovoid zoids that are 0,4-0,5 mm. long and 0,25 mm. broad. The aperture is surrounded by a slightly granular gymnocyst (g) provided with spi-

nes and an inner salient border on which the frontal membrane inserts. A narrow cryptocyst (y) is developed on the lateral and proximal side of the opesia. There are two anterior spines at the distal end of the mural rim that flare outward. Proximally to these one spine on each side is erect and then 5-6 spines on each side and one proximal median bend over the opesia. A proximal gymnocyst (g) outside the mural rim is occasionally present.

Every zoid is connected to its neighbours by about 13 tubes between which spaces (p) are left open. Where many of these tubes meet they give rise to circular kenozoids (c) with a relatively broad cryptocyst. They are provided with spines (s) from which crackles pass to the inner cryptocystal border. None of these kenozoids are developed as avicularia in the present material.

The central area of the basal wall (b) is not calcified. Peg-like processes (d), several of which with short calcareous rooting processes (r), occur on the basal side of the colony. They are confined to the peripherical calcified zone of the zooecial basal wall and are frequent on the inter-zooecial tubes.

Occurrence: Coast of Espirito Santo, 35 mm.

Discussion of *Pyrulella mesitis*. — As the present fragment is without ovicells, the generic classification in *Pyrulella* Harmer (1926, p. 225) or *Hincksina* Norman (1903, p. 585) is not quite certain. As the genotype of *Hincksina*, *Membranipora flustroides* Hcks., has no gymnocyst, the present species should be placed in *Pyrulella*. Also the generic position of *Hincksina periporosa* Canu & Bassler (1928, p. 22) is not beyond all doubt, because its ovicell, although small, can not with certainty be recognized as endo-zooecial, as is that of *H. flustroides* (Levinsen 1909, t. 1: f. 4a-4c). *H. periporosa* has also a short tubular gymnocyst proximal to the aperture that suits better to *Pyrulella* than to *Hincksina*. The measurements of *periporosa* are larger than those of *mesitis*, its kenozoids between the zooecia are pyriform and without spines; in t. 2: f. 9 they look like broken avicularia. After my opinion the "line of interjunctural pores" that surrounds the zoecia of *periporosa* is the same as the network of connecting tubes in *P. sejuncta* (P. H. MacGillivray 1891, p. 78), *P. tubulata* Hastings (1930, p. 709; Osburn 1947, p. 14), *P. caribbea* Osburn (1947, p. 15) and *P. mesitis*. Canu & Bassler describe these pores as covered by the ectocyst and think that they result from an incomplete calcification. Neither the observation nor the conclusion can be accepted. The tubes arise from the gymnocyst, and the foramina between them, the so-called interjunctural pores, are open spaces without any tissue or cuticle over them.

The spines of *P. mesitis* resemble closely those of *P. tubulata* Hast. The only slight difference refers to the number of spines curved over the opesia that are 2-4 and sometimes a median one in *tubulata*. Also the measurements of *tubulata* and *mesitis* agree. But the frontal and basal surface of the two species differ. The small foramina of *tubulata* are large spa-

ces in *mesitis;* the short and broad tubes of the former are long slender bridges in the latter. *P. tubulata* and its var. *triangulata* SILÉN (1941, p. 28) have interzooecial avicularia (heterozoids), not kenozoids. Spines on the connecting network do not occur in *tubulata.* The peg-like processes that attach the zoarium to the substratum are uniformly scattered over the back of *tubulata.* The calcification of the basal wall of *tubulata* is complete. The distribution of the processes of attachment in *mesitis* may possibly be due to a still incomplete calcification, with the progress of which the pegs might develop over the whole basal surface. In *tubulata* no trace of rootlets from the pegs was observed.

P. sejuncta (P. H. MacG.) and variety of *Membranipora lineata* (WATERS 1889, p. 3), later on (id. 1898, p. 678) united with *sejuncta,* do not have the anterior pair of spines that occurs in *tubulata* and *mesitis. P. sejuncta* possesses avicularia, not kenozooecia. In *P. caribbea* Osb. zooeciules (kenozoids) and avicularia occur, but the zoids are smaller than those of *mesitis* and have 2-3 pairs of lateral spines projecting upward.

SMITTIPORA Jullien

Smittipora Jullien 1881, p. 284

As the genera *Rectonychocella* Canu & Bassler (1917, p. 25) and *Velumella* C. & B. (ibid., p. 26) still are used in the litterature (OSBURN 1940, p. 371; 1947, p. 17), their validity must be questioned once more. *Smittipora* was introduced for *Vincularia abyssicola* Smitt (1873, p. 6). As JULLIEN was not quite sure that the two figures of SMITT (t. 1: f. 60, 61) really belong to the same species, he confined (note on p. 285) the description of *Smittipora* to the material of fig. 60.

Besides *Rectonychocella* and *Velumella* CANU & BASSLER introduced *Diplopholeos* (1917, p. 26), later (C. & B. 1928, p. 25) united with *Velumella.* The statement of their descriptions that "the retractor muscles of the polypide are attached in the median axis of the zooecium" and that this position of the retractor fibres affects the symmetry of the opesiules has been criticized by HARMER (1926, pp. 215, 259).

Rectonychocella was introduced with the indication "the opesiular indentations are symmetrical". The genotype of *Rectonychocella, Onychocella solida* Nordgaard (1907, p. 8), however has no identations (see p. 10 of NORDGAARD's description and t. 1: f. 1). In 1928 CANU & BASSLER (p. 52) distinguish *Rectonychocella* from *Velumella* by the absence and presence respectively of opesiular identations. Finally (C. & B. 1929, p. 126) they speak of the genus *Rectonychocella* "which differs from *Velumella* only in its rarely visible identations".

With regard to the identations there is no difference between the two figures of SMITT and that of NORDGAARD; they are absent in all three figures and not mentioned in the descriptions. It is true that SMITT's fig.

60 shows a sector of a colony that is covered by the ectocyst, but thereby it does not become "unreconigzable" (BASSLER 1935, p. 202). If the specimen of fig. 60 had identations, these would appear beneath the ectocyst. Maybe the drying up of the ectocyst has somewhat exaggerated the facets of the cryptocyst, but this does not diminish the value of fig. 60 as genotype of *Smittipora*. Even if this genus were "not established on sufficient characters" (CANU & BASSLER 1928, p. 52), as indeed many descriptions of genera and species become insufficient in the course of some decennaries, the clear indication of a genotype by JULLIEN is quite sufficient to preserve the validity of his genus. Moreover JULLIEN's description mentions the membranous expansion on both sides of the rhachis of the mandible, the only character that separates *Onychocella* and *Smittipora* with certainty. The more or less distinct opesiular identations furnish insecure characters for the classification of fossil specimens.

The characters, mural rim not separated (*Rectonycella*) and distinct from the cryptocyst (*Velumella*), as well as avicularian opesia posteriorly denticulated (*Rectonychocella*) and entirely denticulated (*Velumella*), have been shown by HARMER (1916, p. 259) as useless for generic separation. Moreover *Diplopholeos* has been described with two characters of *Rectonychocella*, viz. "mural rim not separated from the cryptocyst" and avicularian opesia "with a denticulated poster". Notwithstanding the genus has been united with *Velumella*, evidently because the type, an early tertiary species (C. & B. 1917, p. 26), has deep identations, almost true opesiules.

If these identations remain the only difference between *Rectonychocella* and *Velumella*, the first genus becomes a synonym of *Smittipora*: "the apertural area has a trapezoidal form, with rounded distal end, broader in its proximal part, with rounded corners and the proximal margin concave" (SMITT 1873, p. 7). With HARMER I think that SMITT's figures refer to only one species. If not, that of fig. 60 must preserve the name *abyssicola*, not that of fig. 61 (C. & B. 1928, p. 53). The genotype selected by JULLIEN can not be placed at the top of a synonymic list of a species named *americana*.

The variation of the opesiular identations in a species as *Velumella philippinensis* C. & B. (1929, p. 129, t. 13: f. 1-3), where they are sometimes inexistent, in other zoids barely indicated and in still others well marked (they are described as very regular identations), will warn everybody not to separate *Rectonychocella* and *Velumella* by this character. Both are clear synonyms of *Smittipora*.

If *S. abyssicola* has indeed a so little salient mural rim and a convex cryptocyst as is shown by CANU & BASSLER (1928, t. 5: f. 2, 3, especially f. 2), the specific separation of *S. levinseni* C. & B. (1917) (= *americana* C. & B. 1928) seems to be advisable. The specimens from the Indic may be removed from my former synonymic list (MARCUS 1941, p. 17) and placed under *harmeriana* C. & B. (1928). This separation is however provisory; in future HARMER's opinion (1926, pp. 259-260) that these species must be united may prove to be correct.

SMITTIPORA ACUTIROSTRIS (C. & B.)

Figures 5-6

Velumella acutirostris Canu & Bassler 1928a, p. 64, t. 2: f. 4, 5.

The incrusting zoarium is white with dark-brown opercula and mandibles. The approximately hexagonal zooecia are distally more rounded, proximally more angulated and separated by yellow chitinous ridges. The length of the zoids in the present material is 0,6-0,65 mm., the breadth 0,45 mm. When covered by the ectocyst, the zooecia (t) appear flat, nearly without salient mural rim. The calcined zoids (c) show the oblique lateral parts of the cryptocyst and a slightly convex, granulated horizontal part, the latter with projecting distal border.

The opesia is 0,122 mm. high and 0,145 mm. broad in sterile zoids. In ovicelled ones these measurements are 0,125-0,134 and 0,146-0,16 mm. The depressor muscles insert over the middle of the opesiules (opesiular indentations); these are more or less distinct and distally limited by slight projections of the cryptocyst. A prominent tubercle occurs on the distal wall, within the oral arch. This tubercle is smaller than that of *S. harmeriana* (HARMER 1926, t. 16:f. 10) and larger than that of *S. cordiformis* (ibid., f. 14, 15). As in the other species of the genus the operculum has no basal sclerite but is uniformly chitinized and provided with a thick marginal sclerite.

The ovicell is an inconspicuous inflation of the distal wall of the zoid with which its cavity is continuous. The trapezoid opesia of the fertile zooecium is larger than those of ordinary zoids.

The pentagonal or rhombic avicularia (onychocellaria) are large with a rostrum, that is distinct in calcined specimens, and an elliptical opesia, the edge of which is denticulated all around. The mandible is long, its hollow rhachis is hooked at the point, thickened behind it, and toothed basally nearly along its whole length. The membranous expansions are very short and do not extend beyond the proximal fourth. The lower corners of the mandible are each attached to a chitinous tubercle. This seems to be formed by the ectocystal (cuticular) ridge of the aviculariun and that of the adjacent zoid. Earlier observers of this structure are WATERS (1885, p. 778, t. 14:f. 42), NORDGAARD (1907, p. 11, t. 1:f. 3, k) and HARMER (1926, p. 258). The length of the mandible is 0,5-0,55 mm., that of the avicularian chamber up to 0,6 mm., its breadth up to 0,3 mm.

As the measurements of the present zoids and avicularia agree with those given by CANU & BASSLER, and our specimens do not

differ from their sufficiently clear photograph, the indentification of our material with *acutirostris* from the same region is nearly certain. The original description is not detailed.

Occurrence: Coast of Espirito Santo, 35 m.

Distribution: Coast of Bahia and of Espirito Santo, 49-128 m.

STEGANOPORELLA CONNEXA Harmer

Figures 7-8

Steganoporella connexa Harmer 1900, pp. 231, 254-257 t. 12: f. 6, t. 13: f. 18.

non *Steganoporella connexa* Osburn 1914, p. 196 (see OSBURN 1940, p. 377: *Labioporella sinuosa*).

Since this very characteristic species was collected for the first time hundred years ago by the British frigate "Herald" on its circumnavigation of the globe (1848-1851) and described nearly fifty years ago, it has never been found again.

St. connexa is unique in the genus by the occurrence of only B-zoids in its colonies. Also the two closed opesiules on each side are noteworthy. The cryptocyst joins the distal wall, not the basal wall, and the post-oral shelf (mural rim of the lateral and proximal region) is strongly developed even proximally. The zoids are 1,225 mm. long and 0,77 mm. broad. The submarginal sclerite of the operculum, on which the teeth are borne, begins as in the original material near the base of the operculum, but the number of the teeth is smaller (average number: 11). Four central teeth are strong, four lateral small, and the proximal ones minute. The breadth of the opercula with 0,513-0,61 mm. and the height with 0,37-0,4 mm. fall within the variation indicated by HARMER.

Occurrence: Coast of Espirito Santo, 35 m.

Distribution: Victoria Bank (John Adams' Bank), south of Abrolhos Islands, off coast of Espirito Santo.

STEGANOPORELLA TRANSVERSALIS C. & B.

Figures 9-10

Steganoporella transversalis Canu & Bassler 1928a, p. 68, t. 3: f. 1.

Colonies incrusting, with few B-zoids, in the proportion of one to 20 or more A-zoids. There are 3 B-zoids and 17 A-zoids on the photograph that accompanies the original description. With exception

of the opercula the breadth of the two types of zoids is the same, the length of the B-zoids is one third more than that of the A-zoids. Height of the B-opercula: 0,512-0,67 mm., breadth: 0,66-0,77 mm. Height of A-opercula: 0,21-0,3 mm., breadth: 0,46-0,6 mm. As CANU & BASSLER include the opesiules in their measurements of the height of the opesiae, the measurements of the present zooecia agree well with those of the original material.

The cryptocyst does not attain the basal but the distal wall. The median process of the cryptocyst is little depressed. This small depression, the floor of the median process, is formed by the frontal wall, the roof of the polypide tube. The latter has approximately the same breadth in A- and B-zoids and reaches the distal wall of the zooecium in both. Lateral expansions similar to the wings of *St. connexa*, but smaller, are directed from the tube to the lateral walls in the A-zoids. The orifice of the tube is rectangular and opens obliquely upward. The oral shelf is broader in the B-zoids than in the A-zoids and smooth in both. The condyles are prominent.

The A-opercula are of the undifferentiated type with a bow-shaped sclerite. The B-opercula have about 38 sub-marginal, knob-like teeth. The halves of the main sclerite form an incomplete ogee-arch, the oblique sclerites are well developed and join the border at the beginning of the teeth. A moderately thick basal sclerite is present.

Occurrence: Coast of Espirito Santo, 35 m.; littoral of São Paulo, 100 km. east of Santos.

Distribution: Coast of Espirito Santo, 128 m.

STEGANOPORELLA EVELINAE, n. sp.

Figures 11-13

A fragment of a colony of about 6 mm. in diameter, encrusting a calcareous alga in a single layer. In comparison with other species of the genus the present one has small zoids, 0,7-0,8 mm. long and 0,45 mm. broad (A-zoids). The lateral and proximal margin of the zoids, the post-oral shelf, is not separated from the edge, that is the thin summit of the lateral walls, distinct in most other species. Proximally the post-oral shelf forms two blunt cones situated at the sides of the oral shelf of the subjacent zooecium. The horizontal cryptocyst is sharply separated from the post-oral shelf and coarsely tubercular, not porous. It is not depressed before forming the median process. The transverse line of insertion of the edge of the cryptocyst into the basal wall forms a right angle on every side of the polypide-tube. The cryptocyst joins the basal wall between

its distal and middle third. The polypide-tube does not reach the distal wall. Its opening is nearly vertical, invisible in frontal view, as in other species, the cryptocyst of which descends vertically to the basal wall.

The opesiular indentations (lateral or muscular recesses) are narrowed by a horizontal lamella of the cryptocyst that bears a number of sharp teeth on its inner side. The condyles are not well marked and do not serve for the origin of the hinge of the operculum. This is fastened within the membranous ectocyst. There is a small oral arch. The oral shelf surrounds the distal border of the operculum as a narrow rim. The operculum is small, 0,18 mm. broad and 0,146 mm. high. It is undifferentiated, with a broad main sclerite and thick occlusor tubercles. Basal and depressor (epithecal) sclerites are wanting.

B-zoids are rare, 6 appear in the present colony of about 200 A-zoids. Both types are of the same size, but the horizontal cryptocyst is shorter in the B-zoids and the oral shelf is longer, broader and higher. The insertion of the edge of the cryptocyst into the basal wall is farther proximal in the B-zoids and lies in the proximal half. The body-cavity contains mighty divaricator and occlusor muscles but no polypide. The condyles are strong and form the hinge for the operculum, the proximal corners of which are prolonged outwards. The height of the B-operculum is 0,3 mm., its breadth 0,366 mm. It has a basal sclerite and a very broad sub-marginal sclerite with basal reforcements, that bears 5-9 very stout teeth.

Occurrence: Coast of Espirito Santo, 35 m.

Discussion of *Steganoporella evelinae*. — The species differs from all others in the genus by the absence of functional polypides in the B-zoids with enlarged opercula. *St. mandibulata* Harmer (1926, p. 279) has also zoids without polypides, but these are typical avicularia, much smaller than the autozoids. There are further and partly very important differences between *St. evelinae* and the other species of the genus, viz., the small A-opercula that lie in the membranous ectocyst, the broad post-oral shelf that is confluent with the edge, the toothed opesiules, and the non-porous cryptocyst. The present collection also contains a *Labioporella* with polypide-bearing avicularia, *L. dipla*. Therefore I prefer to preserve the present species in *Steganoporella* and *L. dipla* in *Labioporella*, instead of introducing two new genera with one species each.

Harmer considers the B-zoids as avicularia (1900, p. 236; 1902, p. 320; 1926, pp. 189, 268). Silén (1938, pp. 342-347) opposed to this opinion that in avicularia no polypides occur and the enlargement of the operculum is correlated with shortening of the cystid. Both phenomena can be observed in the B-zoids of *St. evelinae*. The shape of the main sclerite of the B-opercula of the new species does not show appro-

ximation to the cuspidate avicularian mandible form. It does not continue the series of inverted U (group I), inverted V (group II) to inverted Y (group III) established by HARMER (1900, pp. 242, 266; 1926, p. 269). The B-operculum of *St. evelinae* belongs to the first group, "the mandibles of which are not unlike the opercula" (l. c.). But I do not see an argument against HARMER's theory in the shape of the sub-marginal sclerite of the B-operculum of *St. evelinae*. Beside *St. mandibulata* with triangular-cuspidate mandible other species with rounded-spatulate or broad tongue-shaped vicarious avicularia may still be discovered. Avicularia with distally pointed and distally rounded mandibles occur in *Labioporella*, *Thalamoporella* and many other genera.

Important features of the B-zoids of *St. evelinae*, the suppression of the polypide and the increase of the oral shelf that corresponds to an avicularian rostrum, favour HARMER's opinion.

LABIOPORELLA DIPLA, n. sp.

Figures 14-16

Colony incrusting; zoids oblong, rectangular or hexagonal. Polypide-tube nearly median, complete, fastened to the basal wall by a vertical connection on its whole length. Its basal margin is convex, the frontal one a little concave. The descending lamina of the cryptocyst joins the basal wall in a slightly angulate transverse line. The horizontal cryptocyst is granulated and pierced by scattered round pores. The post-oral shelf is covered with tubercles on both sides. It is narrower at the proximal side and passes into the oral shelf that is also narrow in most zoids. A prominent tubercle on the distal wall appears beneath the operculum. The latter has a marginal but no basal sclerite; it does not reach the oral (vestibular) arch.

The two bundles of depressors of the frontal membrane described in *L. spatulata* Harmer (1926, p. 284) originate in the bend of the lateral recesses and insert into the frontal membrane at different points. Farther outward another pair of muscles originates, the contraction of which opens the diaphragm. On the distal side of the lateral recesses the strong occlusors originate and their tendons insert into the marginal sclerite of the operculum.

The autozoids are 0,6 mm. long and 0,3-0,4 mm. broad; the breadth of the polypide-tube is 0,13 mm. The height of the opesia is 0,22 mm., its breadth 0,27 mm. The operculum is 0,14 mm. high and 0,17 mm. broad.

The large avicularia are rare, they are provided with a polypide as big as that of the autozoids and have a very broad oral arch. The post-oral shelf and the horizontal cryptocyst are similar to the corresponding structures of the autozooecia, but there are only gra-

nules on the cryptocyst, no pores. The descending cryptocyst joins the basal wall in a straight line. The polype-tube passes through a median hole of the cryptocyst and this hole is flanked by two distally prominent knobs on which the strong depressor muscles originate. These function as divaricators of the mandible. The shape of the latter is rounded-spatulate, widened distally and provided with about 50 minute teeth on its free margin. It has a concave basal sclerite; the two halves of its main sclerite support only the proximal half of the mandible, dying away distally.

The length of the avicularium is 0,85 mm.; the mandible is 0,34 mm. long and basally 0,122 mm. broad.

Occurrence: Coast of Espirito Santo, 35 m.

Discussion of *Labioporella dipla*. — As SILÉN (1941, p. 62) has described a species of *Siphonoporella* with avicularia and without gymnocyst, the distinction between *Labioporella* and *Siphonoporella* becomes reduced to the median (or sub-median) and the oblique position of the polypide-tube. The operculum is membraniporine in both genera. The present species with its polypide-bearing large avicularia approximates *Labioporella* to *Steganoporella*, the B-zoids of which are similar to the avicularia of *L. dipla*. One of SILÉN's arguments against HARMER's theory that the B-zoids of *Steganoporella* are avicularia is the regular reduction of the cystid in vicarious avicularia. *L. dipla* however possesses avicularia, whose length surpasses that of the autozoids.

Siphonoporella granulosa Canu & Bassler (1928, p. 68) and the present species have similar measurements, and the length of the avicularia (C. & B. call them B-zoids) is the same. Moreover *S. granulosa* occurs also on the Brazilian coast (bay of Bahia; C. & B. 1928a, p. 69). As the polypide-tube is eccentric and oblique in *S. granulosa*, I think that it is indeed different from *L. dipla*. Besides SILÉN's *S. aviculifera* also *S. granulosa* and *S. dumonti* C. & B. (1928, p. 68) show that avicularia occur in *Siphonoporella*. The two American species even have a polypide-tube in their B-zooecia, and thus are presumably provided with a functioning polypide.

L. dipla differs from all known species of *Labioporella* by the polypide-bearing avicularia. A balsam slide of *L. bursaria* (P. H. MacG.) from Bunbury, S.W. Australia (R. HARTMEYER leg., Fig. 17) shows the shortening of the post-oral shelf and the corresponding sub-opercular area (horizontal cryptocyst and opesia) in the vicarious avicularium of this species. The diminution of the proximal region may be correlated with the loss of the polypide. Perhaps the development of a polypide was obstructed by the strong median cryptocystal knob on which the divaricators originate in *L. bursaria*. This knob that is fastened to the basal wall only in the median line, corresponds to the two knobs that flank the polypide-tube in *L. dipla*.

Of the 5 species described by HARMER (1926, pp. 281-287) *L. bursaria* is the least distant from *L. dipla*. It has also tubercles proximally on the cryptocyst of the autozoids (not constant; l.c., p. 285) and the unilateral tube, that augments the difficulty of separating the genera *Labioporella* and

Siphonoporella. The beak and the mandible of *L. adeliensis* Livingstone (1928, p. 29) are sharply pointed. *L. sinuosa* Osburn (1940, p. 377) has no avicularia. The descending lamina of the cryptocyst of each side joins the basal wall without meeting that of the other side. *L. altavillae* Cipolla (1921, p. 59), a pliocene species without avicularia, has slightly narrower autozooecia than *L. dipla* and tubercles like *L. bursaria* in some zoids. Also in *L. miocenica* Canu & Bassler (1919; see 1923, p. 67) and *L. elegans* Sakakura (1935, p. 13), both with tranverse opesia, no avicularia were found.

Micropora coriacea (Johnst.)

Figure 19

Harmer's proposition (1926, p. 307) to consider *Flustra coriacea* Johnston (1847, p. 349, t. 56: f. 8) as the first valid description of this well-known species was accepted by Bassler (1935, p. 148), and it seems indeed better not to use the older form *Micropora coriacea* (Esper 1806-16) any more. The fragment of *M. coriacea* in the first samples from the coast of Espirito Santo was dead, when collected, and without chitinous parts. Therefore we give a figure only now that a complete colony is available.

Strangely enough the species known for the West Indian region since 1873 (Smitt, p. 13) appears for the first time from Brazil in the present collection.

Occurrence: Coast of Espirito Santo, 35 m.

Distribution: With exception of the Arctic region the species has been found in all seas, also in the Antarctic realm, in shallow water and down to 823 m.

Mollia elongata C. & B.

Figure 18

Mollia elongata Canu & Bassler 1928a, p. 62, t. 1: f. 6-9.

The zoids are disposed like scales and are 0,5-061 mm. in lenght, 0,28-0,37 mm. in breadth. The height of the opesia is 0,15-0,16 mm., its breadth 0,13-0,16 mm. The measurements of the original material, especially those of the opesia are larger, but the proportions agree. Some details must be added to the original description, viz. the vestibular arch that appears beneath the operculum, the large cryptocyst that extends on both sides of the orifice, the depressor muscles passing through the opesiules to their insertion into the fron-

tal membrane, the volumous ovicells that are immersed in the zoid above, and the calcareous papillae on the basal surface.

The generic name *Mollia* is used here in accordance with CANU & BASSLER (l. c.), NORMAN (1909, p. 286) and BASSLER (1935, p. 149). WATERS (1925, p. 347) disagrees with this nomenclature. A comparison of the present species with the description and figures of the genotype (SMITT 1873, p. 12; WATERS 1879, p. 120; P. H. MACGILLIVRAY 1886, p. 70, t. 117: f. 9-10) makes it probable that both are congeneric.

Occurrence: Coast of Espirito Santo, 35 m.

Distribution: Coast of Bahia and of Espirito Santo, 49-128 m.

BUGULA CARVALHOI, n. sp.

Figures 20-21

Two white colonies, 10-15 mm. in height, growing on *Steganoporella transversalis* C. & B., to which they are fastened by rootlets. These surround the zoids at the base of the stem in so great a number that ancestrular details can not be distinguished. The zoaria are broad, fan-shaped and ramify immediately above their basis; the free growing-points are slightly curled inwards. The branches are biserial, rarely 2-3 triserial successions of zoids occur. The length of the zooecia is 0,4-0.45 mm., the breadth 0,15 mm. The aperture occupies the entire front-wall or nearly the whole. One stout, pointed spine, 0,1 mm. in length, projects frontally at the external and one on the internal distal angle. These 2 spines are very constant in sterile as well as in ovicelled zooecia. The outer limb of the forked proximal end of the zoid reaches the insertion of the avicularium, the inner one descends still farther. The type of the bifurcation is that of *B. scaphoides* Kirkp. (HARMER 1926, p. 433, f. 23-B, type 4). In several cases the zoid F is imperfect and therefore the bifurcation becomes irregular. There are 13-15 tentacles. Only one generation of larvae is developed in the two present colonies; the polypides do not regenrate after the hatching of the first larvae.

The length of the avicularia (0,18 mm.) exceeds the breadth of the zoids. They are strong and situated laterally in the distal half of the zooecia. The tip of the rostrum and mandible is bent; the peduncle originates on the under side of the avicularium between the articulation of the mandible and the posterior curvature of the head.

The ovicells have no peduncle and are superposed to the zoid with the whole breadth of their proximal border. They are no more

than 0,1 mm. high, and only a narrow edge of the calcified ecto-ooecium appears frontally, where the membranous vesicle closes the ovicell. The growing embryo depresses this vesicle into the zooecial cavity down to the level of the insertion of the avicularium.

The species is named in honour of its collector, my friend Mr. João de Paiva Carvalho.

Occurrence: Littoral of the state of São Paulo, 100 km. east of Santos.

Discussion of *Bugula carvalhoi*. — *B. flabellata* (J.V.Thomps.) is similar, but as a rule its branches are multiserial, its distal spines are more numerous, its ovicells are high and have a peduncle. In *B. flabellata* even the larva ready for hatching maintains its hyperstomial position (Correa 1948, t. 8: f. 57-60).

The fragment of *Bugula* from the ilha das Palmas (Marcus 1938, p. 28, t. 6: f. 13B) belongs probably to *B. carvalhoi* and not to *B. flabellata*. Discussing this specimen I referred to the Floridan material of Smitt (1872, p. 18, t. 5: f. 48-52) that also has only two distal spines and successions of biserially disposed zoids. However it shows high ovicells with the characteristic peduncle of *flabellata* that is absent in the present species and in the fragment from the ilha das Palmas.

Coleopora corderoi, n. sp.

Figures 23-25

The encrusting colony is composed of regular longitudinal series of very big zoids (length: 1,4-1,8 mm.; breadth: 0,7 mm.), most of which are rectangular in shape, but may also be of more irregular form at ramifications and where the substratum is uneven. To the latter the zoarium is attached by calcareous tubules of the basal wall. These are more numerous at the marginal portions of the basal wall than in the middle. On the limits the zoids are distinctly bordered and areolated. Their ventricose frontal wall is granulated and becomes tuberculated with the progress of calcification. Scattered pores appear between the tubercles. The sculpture dies away towards the distal region of the zoid where a smooth, tubular peristome (peristomie in the terminology of Canu & Bassler 1927, p. 6) rises. The orifice of the peristome (secondary orifice or peristomice) is round. An avicularium with a curved, cuspidate mandible (length: 0,23 mm.) is fixed to the inner side of the peristome, where it lies slightly beneath the border or farther down. The avicularium is not present in all zoids. The orifice of the zooecium (primary orifice) can only sometimes be seen at the bottom of the peristome. The operculum is 0,28-0.37 mm. broad. It has a convex basal border

and laterally produced proximal corners, is chitinized all around, and provided with two oblique sclerites ("attachments") on the distal part of which the occlusors are fastened. The globose ovcell opens into the cavity of the peristome and reclines on to the front-wall of the following zoid. Its ecto-ooecium has the same sculpture as the zooecial frontal.

The species is named in honour of Professor Dr. Ergasto H. Cordero in recognition of his zoological work.

Occurrence: Coast of Espirito Santo, 36 m.

Discussion of *Coleopora corderoi*. — The genus *Coleopora* that belongs to the Petraliidae was introduced for a Miocene (Tortonian) species from the palaeontologically well-known Austrian (formerly Hungarian) locality Eisenstadt (CANU & BASSLER 1924, p. 679). Its frontal is nearly smooth. Three years later (C. & B. 1927, p. 6) the genus was described with a recent species, *C. verrucosa*, from the Philippine region as type (C. & B. 1929, p. 267). The thick, crenulated orifice of the peristome and the tubes of the frontal distinguish *C. verrucosa* at once from *C. corderoi*. Less numerous, but still more salient tubes occur in *C. americana* from Porto Rico (OSBURN 1940, p. 411). Also each of the frontal pores of *C. erinacea* C. & B. (1929, p. 268) is surrounded by a tubular "peristome". The zoids of *C. seriata* C. & B. (1929, p. 270) are disposed in bi- to multiserial branches and not provided with areolae. The species nearest to *C. corderoi* is *C. granulosa* C. & B. (1928, p. 82) from the Miocene of Panama. The zoids are separated by a very thin thread (not very thin in *corderoi*) and also other details of the sculpture are similar. Bdt in *C. granulosa* the zoids are broader, and the peristome seems to be less salient and not smooth. After CANU & BASSLER *C. granulosa* approaches *C. minutipora* C. & B. from the Philippines very closely. As this name does not occur in *Coleopora*, the comparison probably refers to *C. seriata*.

The absence of avicularia is expressly mentioned in the description of *C. americana* Osb., and in none of the other diagnoses the occurrence of avicularia is indicated. *C. corderoi* is evidently the first species of the genus with avicularia, that are frequent in other genera of the family.

UTINGA, n. g.

Petraliidae with not fenestrate zoarium, the operculum not especially thick, its poster with a concavity in the middle of the proximal border, that corresponds to a rounded lyrula of the orifice. Cardelles present; neither raised peristome nor suborificial mucro. One distal radicular chamber.

Type of the genus: *Utinga castanea* (Bsk.).

The work that I consider as the fundament of the modern system of the Cheilostomata (LEVINSEN 1909, p. 350) united a great number of species from the older genera *Lepralia, Mucronella* and *Petralia* in the family Petraliidae

with the only genus *Petralia*. CANU & BASSLER (1927, pp. 5-6) int the new genera *Petraliella* and *Coleopora*, the latter well character the high peristome. The type of *Petraliella* is *Escharella bisinuat* (1873, p. 59), and therefore the genus is valid, although it was d without separation from *Petralia* P. H. Mac Gillivray (1868, p. 141 in 1929 a distinguishing character between *Petralia* and *Petralie* published: ovicell closed (*Petralia*) and never closed (*Petraliella*) operculum. It is evidently a typographical error, that the ovicell of t new species of *Petraliella* described by CANU & BASSLER, *P. marginat* p. 80) is said to be closed by the operculum: on the next page (p. authors say that the operculum closes the oœcium only when it securing the pasage of the egg. As in the present species the opercul not shut the ovicell when it is completely closed, but is not alway in this position in the preserved material, it is better to aband character. STACH (1936, p. 355) includes only such species in the Pet whose ovicell opens above the normal plane of the zooecial aperture.

In STACH's revision, the base of the present classification, *Petralia* and *Petraliella* C. & B. are exactly defined, and three other genera w sub-genera described. The new genus *Utinga* differs from *Petraliella* absence of the two large sinuses in the proximal rim of the aperture exception of *Pachycleithonia nigra* C. & B. (1930, p. 25), that has a poster but is quite different from *Utinga* in other respects, *U. cast* the only species of the Petraliidae with a central concavity of the p must however be said that the opercula have not yet been figured species.

KEY TO THE GENERA OF PETRALIIDAE (mostly after STACH 1936, p. 3

1 With secondary orifice (peristomice); the primary orifice (a closed by the operculum) hidden at the bottom of a tubular pe (peristomie; CANU & BASSLER, 1920, p. 56) *Coleopora* C
Primary orifice distinct in frontal view, no secondary orifice.

2 Operculum very thick, black; muscular attachments indistingu *Pachycleithonia* C
Operculum more or less weakly chitinized, transparent, with a for the insertion of the occlusors on each side.

3 Zoarium fenestrate. *Petralia* P. H.
Zoarium not fenestrate.

4 With a suboral mucro.
Without a suboral mucro.

5 With a lyrula.
Without a lyrula. *Sinupetraliella*

6 Radicular chamber or chambers restricted to the distal end basal wall. *Mucropetraliella*
Radicular chambers scattered over the whole basal wall. *Peripetraliella*

7 With a lyrula. 8
Without a lyrula. 9

8 Proximal rim of the aperture indented by two large sinuses. *Petraliella* C. & B.
Proximal rim of the aperture without sinuses on both sides of the lyrula. *Utinga*, n. g.

9 Proximal rim of the aperture entire. *Hippopetraliella* Stach
Proximal rim of the aperture serrate. *Serripetraliella* Stach

UTINGA CASTANEA (Bsk.)

Figures 26-29

Mucronella castanea, Busk 1884, p. 157, t. 19 (*Hemeschara cast.*), f. 6-6 c.
Lepralia castanea, Waters 1888, p. 28, t. 3: f. 36-37.
Petralia castanea, Levinsen 1909, pp. 350-351.
Petralia castanea, Waters 1913, p. 519.
Petralia castanea, Waters 1925a, p. 542.

The zoarium is flat, unilamellar. The slightly convex zoids are disposed quincunxially, separated by thin but distinctly raised borders, and rectangular or longitudinally hexagonal in shape. Their length is 1-1,2 mm., the breadth 0,5-0,7 mm. Their lateral walls communicate by multiporous rosette-plates. The frontal is a granular tremocyst with a slight marginal areolation. The coarse frontal pores are connected by crackles that form the rhombic mashes of a network. The basal wall of each zoid bears a single radicular chamber at its distal end. The border of this pore-chamber (dietella) is distinct but not raised.

The aperture is up to 0,28 mm. in height and 0,22 mm. broad. The coarctate shape of this orifice is due to the rounded and little projecting cardellae (hinge-teeth; HASTINGS 1932, p. 438) that lie outside the operculum. They are situated at a considerable distance (0,122 mm.) from the proximal border. The latter, the lower lip of BUSK's diagnosis, was described as bluntly mucronate. That is right, but it must be added that the broadly triangular tooth or mucro lies on the inner side of the low peristome and therefore corresponds to a lyrula. A suborificial mucro is not developed. The horseshoe-shaped operculum is rather well chitinized, the anter has a thick and distally continuous marginal sclerite, the poster is broad and concave in the middle of its proximal border.

The ovicell is volumous, salient but flattened in the centre of the frontal wall, that is provided with fine pores. The ovicell opens a little above the plane of the orifice of the zoid, but the not com-

pletely shut operculum may close both orifices, that of the zoid a that of the ovicell. If the operculum lies horizontally apposed the vestibulum, it leaves the ooecium open. On one or both sid of the proximal border of the ovicell there is a small avicularia with a rounded mandible that is directed proximally.

The strong zooecial avicularia are directed distally on one both sides of the zoid. They measure 0,37 mm. in length. The sl der, cuspidate (0,32 mm. long) mandible attains the level of an of the operculum.

The polypides are bright brown; the number of tentacles is As in *Mucropetraliella armata* (WATERS 1913, p. 519) and ot species, the inner epithelium at the base of two tentacles in the m dle of the abanal side is thickened.

Occurrence: Coast of Espirito Santo, 35 m.

Distribution: Challenger Station 122, off coast of Alagoas. m.; off Bahia, 18-37 m.

ESCHAROIDES MARTAE Marc.

Figure 30

The first description published in the Arq. Mus. Nac. Rio Janeiro (MARCUS 1949) did not include the ovicells that only re found in the colonies selected now. The ooecium is broader t high, provided with a few large areolae at the border, and a cu date mucro in the centre. The secondary orifice of the fertile zoi somewhat different from that of the sterile ones. One spine bulbiform base rises on each side of the transverse orifice of the ristome. The latter has a median roundish notch in its proxi border.

SMITTINA NUMMA, n. sp.

Figures 31-33

Zoarium encrusting, unilamellar. Zoids not very uniform in pe, some rectangular or nearly quadratic in outline, others irreg ly polygonal and even broader than long. The maximum lengt 0,61 mm. The zooecia, disposed in linear series and separated smooth lines, are strongly areolated around the margin. The f wall is not completely even but has some sight gibbosities and sh pits between them. The wall is raised in the middle, where an a larium with a thin mandible directed downwards occurs in