

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
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CONTRIBUTIONS TO THE GEOLOGY AND PALEONTOLOGY OF THE CANAL ZONE, PANAMA, AND GEOLOGICALLY RELATED AREAS IN CENTRAL AMERICA AND THE WEST INDIES

BRYOZOA OF THE CANAL ZONE
AND RELATED AREAS

By FERDINAND CANU
Of Versailles, France

AND

RAY S. BASSLER
Of Washington, District of Columbia

Extract from Bulletin 103, pages 117-122, with Plate 53



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The following pages contain the descriptions of the few bryozoa that have so far been found in the rocks of the Canal Zone and related areas. These bryozoa consist of two species from the Emperador limestone of the Canal Zone collected by Messrs. T. Wayland Vaughan and D. F. MacDonald and three species from the Miocene of Costa Rica collected by D. F. MacDonald. The list of species described is as follows:

Ogivalina mutabilis, new species, Emperador limestone, Panama Canal Zone.

Holoporella albirostris (Smitt), Emperador limestone, Panama Canal Zone.

Cupularia umbellata Defrance, Miocene, Costa Rica.

Cupularia canariensis Busk, Miocene, Costa Rica.

Stichoporina tuberosa, new species, Miocene, Costa Rica.

Order CHEILOSTOMATA.

Group MEMBRANIPORAE.

Genus OGIVALINA Canu and Bassler.

OGIVALINA MUTABILIS, new species.

Plate 53, fig. 1.

The zoarium is incrusting. The zoecia are elongated, oval, distinct, separated by a deep furrow; the mural rim is thin, smooth, rounded; there is often a small gymnocyst. The opesium is very large, irregular, more often oval. The ovicell is endozoecial, small,

little convex. Sometimes there is a small interzoecial fusiform avicularium (?).

Measurements.—	Opesium	$\left\{ \begin{array}{l} ho=0.60-0.70 \text{ mm} \\ lo=0.30-0.45 \text{ mm} \end{array} \right.$
	Zoecium	

The great irregularity of form and zoecial dimensions of this species justifies its name. There are some variations which recall those of *Membranipora irregularis* Manzoni, 1875¹ which possesses a mural rim enlarged at the base and also some large interzoecial avicularia.

The present species differs from the splendid *Ogivalina eximipora* Canu and Bassler from the Middle Jacksonian of North and South Carolina in its smaller dimensions, in the absence of cryptocyst, and in the presence of a gymnocyst. The avicularium (?) is identical in form and position.

Occurrence.—Emperador limestone, old quarry, one-third mile north of west of Empire, Panama Canal Zone. D. F. MacDonald and T. Wayland Vaughan, collectors, 1914, Station No. 6016.

Southwest side Crocus Bay Hill, Anguilla, Leeward Islands. T. Wayland Vaughan, collector, 1914, Loc. No. 6893.

Holotype.—Cat. No. 65039, U.S.N.M.

Family OPESIULIDAE Jullien.

Genus CUPULARIA Lamouroux.

CUPULARIA UMBELLATA DeFrance, 1823.

Plate 53, figs. 2-4.

1908. *Cupularia umbellata* CANU, Iconographie des Bryozoaires fossiles de l'Argentine, Anales del Museo Nacional de Buenos Aires, vol. 17, p. 275, pl. 5, figs. 4, 5. (See for complete bibliography.)
1909. *Cupularia umbellata* CANU, Bryozoaires fossiles du Sud-Ouest de la France, Bulletin de la Société Géologique de France ser. 4, vol. 9, pp. 448, 454, pl. 16, figs. 16, 17. (Regional bibliography.)
1909. *Cupularia lowei* NORMAN, On the Polyzoa of Madeira, Journ. Linnean Soc., vol. 30, p. 290, pl. 37, figs. 7-12.
1913. *Cupularia umbellata* CANU, Étude comparée des Bryozoaires Helvétiques de l'Égypte avec les Bryozoaires vivants de la Méditerranée et de la Mer Rouge, Mem. a l'institut Egyptien, vol. 6, fasc. 3, p. 205.
1913. *Cupularia umbellata* CANU, Cont. a l'étude des Bryozoaires fossiles, pt. 5, p. 125; pt. 7, p. 126; pt. 12, p. 127; Bulletin Soc. Geol. France (IV, XIII).
1914. *Cupularia lowei* OSBURN, The Bryozoa of the Tortugas Islands, Florida. Publication No. 182, of the Carnegie Institution of Washington, p. 194.

¹ Briozoi del pliocene antico di Castrocaro, Bologna, 1875, p. 10, pl. 1, figs. 5, 8.

The fossils which are identified as above are rather well preserved and their determination is easy. The pores of the hydrostatic zoecia are not radicular. We are ignorant as to why Norman, who is a great lover of archaic names, has not preserved the name of Defrance. The figures published by this author and by d'Orbigny are excellent and leave no doubt as to the identity of the two species.

Occurrence.—Miocene, Banana River, Costa Rica. D. F. MacDonald, collector, 1911. Bowden marl, Bowden, Jamaica.

This species is almost always associated with *C. canariensis* Busk. Like the latter, it commences in the Alum Bluff formation and continues in the higher Miocene and Pliocene deposits of the United States.

Geological distribution.—Aquitanian of Italy (Seguenza, Neviani), of Bordeaux (Canu). Burdigalian of Italy (Seguenza, Canu), of Bordeaux (Canu). Helvetian of Italy (Seguenza), of Touraine (Canu), of Bordeaux (Canu), of Maryland (Ulrich), of Egypt (Canu). Tortonian of Provence (Canu), of Italy (Seguenza). Plaisancian of England (Busk), of Italy (Manzoni). Astian of Italy (Neviani, Canu), of Provence (Canu). Sicilian of Italy (Neviani). Quaternary of Italy (Seguenza), of England (Canu).

Habitat.—Mediterranean. Atlantic to the Canary Islands, and Florida. It is common in the Gulf of Gascony in the Miocene; it has now disappeared from it.

It has been dredged at a depth of 11 to 48 meters in America and from 81 to 113 meters in Madeira.

CUPULARIA CANARIENSIS Busk.

Plate 53, figs. 5-7.

1908. *Cupularia canariensis* CANU. Iconographie des Bryozoaires fossiles de l'Argentine. Anales del Museo Nacional de Buenos Aires, vol. 17 (ser. 3, vol. 10). pt. 1, p. 275. pl. 5, figs. 8, 9, 10. (See for complete bibliography.)

1909. *Cupularia guineensis* NORMAN, The Polyzoa of Madeira and neighboring islands, Linnean Society's Journal, Zool., vol. 30 (July), p. 289, pl. 37, figs. 2-6.

1914. *Cupularia guineensis* OSBURN. The Bryozoa of the Tortugas Islands, Florida, Publication No. 182, of the Carnegie Institute of Washington, p. 194.

The beautiful figure published by Busk in 1859, has led all paleontologists to use the specific term *canariensis*, especially since the same author distinguished this species from *Cupularia guineensis* Busk, 1854. For a half century, it was therefore employed by Busk, Waters, Manzoni, Van den Brock, Neviani, Seguenza, De Angelis, and Canu.

Now it appears established that Busk's two species are identical (Norman, Osburn). We do not believe it necessary to change the

names of these species as the latter authors have done since the author of each is the same. A simple question of date ought not alter all the literature of this species which although it has never been entirely published is nevertheless quite important.

Our American specimens are well preserved.

Occurrence.—Miocene, Banana River, Costa Rica. D. F. MacDonald, collector, 1911. Bowden marl at Bowden, Jamaica.

The earliest occurrence of this species in the United States is in the Alum Bluff formation, but it is found also at many other horizons of the Miocene and Pliocene.

Geological distribution.—Burdigalian of Bordeaux (Collection Canu). Helvetian of France (Canu) of Spain (De Angelis). Tortonian of Austria-Hungary (Reuss), of Italy (Seguenza). Plaisancian of Italy (Manzoni), of England (Busk), of Spain (De Angelis), of Algeria (Canu). Astian of Italy (Neviani, Canu). Sicilian of Rhodes (Manzoni), of Italy (Neviani). Quaternary of Italy (Neviani), of Argentina (Canu). Miocene of Australia? (Waters).

Family CELLEPORIDAE Busk.

Genus HOLOPORELLA Waters.

HOLOPORELLA ALBIROSTRIS (Smitt).

Plate 53, fig. 8.

1873. *Discopora albirostris* SMITT, Floridan Bryozoa, pt. 2, Kongl. Svenska Vetenskaps-Akademiens Handlingar, vol. 11, No. 4, p. 70, pl. 12, figs. 233-239.

1889. *Cellepora albirostris* JELLY, A Synonymic Catalogue of the Recent Marine Bryozoa, p. 45. (See for complete bibliography.)

1914. *Holoporella albirostris* OSBURN, Bryozoa of Tortugas Islands, Pub. 182, Carnegie Institution, p. 215.

Of the two specimens of this species which have been collected at Panama and at Anguilla one corresponds to Smitt's figure 237 and the other to figure 238.

Occurrence.—Rare in the Emperador limestone at the old quarry one-third mile north of west of Empire, Panama Canal Zone, D. F. MacDonald and T. Wayland Vaughan, collectors, 1911 (Station No. 6106). Also rare along the southwest side of Crocus Bay, Anguilla, Leeward Islands, Dr. T. Wayland Vaughan, collector, 1914, Loc. No. 6894.

Geological distribution.—Miocene of Australia and New Zealand (Waters). Habitat. Atlantic off Florida. Pacific off Australia. Specimens have been dredged off Australia to a depth of 121 meters. Smitt in Florida has discovered them between 40 and 56 meters, but Osburn states that it abounds at a depth of 24 meters.

Family CONESCHARELLINIDAE Levinsen.

Genus STICHOPORINA Stoliczka.

STICHOPORINA TUBEROSA, new species.

Plate 53, figs. 9-12.

The zoarium is free, conical, hollow with very thick walls. The peristome is salient, ornamented with small tuberosities; it bears one or two small elliptical avicularia with bar or denticles. The ovicell is large, somewhat salient, convex; it is hyperstomial and always closed by the operculum. On the lower face, there are large pores surrounded by very small ones.

Measurements.—Apertura $\begin{cases} ha=0.15 \text{ mm.} \\ la=0.09 \text{ mm.} \end{cases}$

This is a very elegant species characterized by its peristomial tuberosities. The ancestrula is visible only in the interior of the zoarium; it is covered exteriorly by the first zoecia. All the zoecia are separated from each other by small canals which appear to end in the large, inferior pores.

This species must not be confounded with *Mamillopora cupula* Smitt, 1872. It differs from it in its ovicell which is not bilobate and in its ovarian zoecia which are not larger than the others.

Occurrence.—Miocene, Banana River, Costa Rica, D. F. McDonald, collector, 1911.

Cotypes.—Cat. No. 65040, U.S.N.M.

EXPLANATION OF PLATE 53.

Ogivalina mutabilis, new species.

FIG. 1. The type-specimen, $\times 20$, with large irregular opesia, small ovicell, small gymnocyst and one zoecium with a fusiform avicularium.

Emperador limestone, Crocus Bay Hill, Anguilla.

Cupularia umbellata DeFrance.

FIG. 2. Two zoaria, natural size.

3. Celluliferous convex surface, $\times 20$.

4. Concave surface, $\times 20$.

Miocene, Banana River, Costa Rica.

Cupularia canariensis Busk.

FIG. 5. Two zoaria, natural size.

6. Celluliferous convex surface, $\times 20$.

7. Concave surface, $\times 20$.

Miocene, Banana River, Costa Rica.

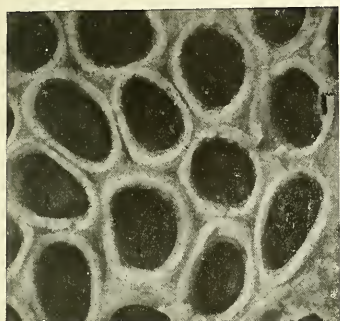
Holoporella albirostris (Smitt).

FIG. 8. Several zoëcia much enlarged (after Smitt).
Recent, Gulf of Mexico.

Stichoporella tuberosa, new species.

FIG. 9. Two zoaria, natural size.

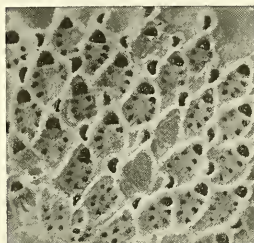
10, 11. Two views $\times 20$ of the convex, celluliferous side.
12. Photograph of the concave side, $\times 20$.
Miocene, Banana River, Costa Rica.



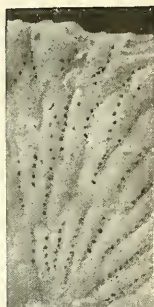
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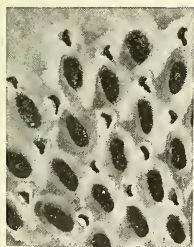
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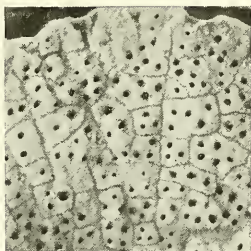
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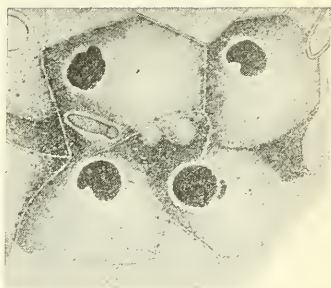
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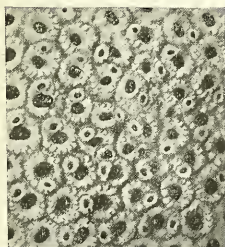
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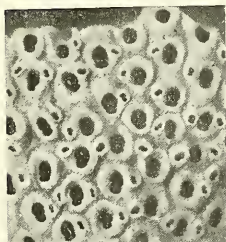
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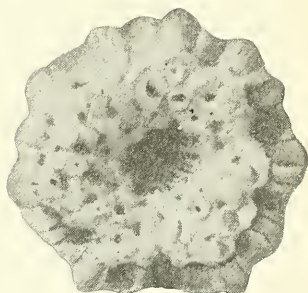
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10



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BRYOZOA OF THE PANAMA CANAL ZONE AND RELATED AREAS.

FOR EXPLANATION OF PLATE SEE PAGES 121, 122.

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[Synonyms are in italics.]

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