A NEW SPECIES OF DASYCLADACEAN ALGA FROM THE PLAYA GRANDE FORMATION (PLIOCENE) OF NORTHERN VENEZUELA

NORMAN E. WEISBORD
DEPARTMENT OF GEOLOGY, FLORIDA STATE UNIVERSITY
TALLAHASSEE, FLORIDA

The dasycladacean or "green" alga described in this note is rare, and occurs in a bioherm of coralline or "red" algae. The bioherm, which has been referred to by Weisbord (1957, pp. 14, 15, 16, and geologic map; 1964, figs. 6-7) as a *Lithothamnium* reef, is 2 meters thick, and is exposed uninterruptedly for a distance of approximately 150 meters in a bluff along the coast at Punta Gorda, Distrito Federal, Venezuela. The bioherm or reef consists in large part of irregular nodular masses of coralline algae, but within the bioherm there are pockets of sandstone containing numerous other fossils some of which after weathering out to the surface of the bioherm adhere to it and are well preserved. The bioherm lies within the Maiquetía Member of the Playa Grande Formation (Weisbord, 1957) which, to judge from the percentage of mollusks that have survived to Recent time (Weisbord, 1962; 1964), is early Pliocene in age. Among other fossils washed out (in the laboratory) of sandstone obtained within the bioherm were two tubular fragments of a small dasycladacean alga. The species is believed to be new, and is described under the name of *Neomeris venezuelensis*.

Systematic Description

Phylum CHLOROPHYCOPHYTA

Family DASYCLADACEAE

NEOMERIS VENEZUELENSIS Weisbord, n. sp.

Pl. 1, figs. 1-7

The thallus is a slightly curved, thick-walled, gradually tapering calcareous tube, hollow within, and circular in cross section. The exterior of the tube is annulated by broad low swellings about 0.18 mm apart on specimen S75B, and is divided into narrow subequally spaced concentric segments which are the surface expression of the whorls. On the exterior of the thallus there are numerous pin-sized pores disposed regularly in rows, with two rows of pores in each whorl. These pores represent the distal extremities of the secondary branches, and on the holotype (S75a), which is an incomplete thallus 4 mm in length, there are approximately 56 rows of them or 14 rows per millimeter length of the thallus. Around the large end of the holotype (diameter 1.2 mm) there are about 42 pores in a row, and around the small end (0.85 mm in diameter) about 32 pores in a row. The pores in one row of the whorl are offset one space from the pores in the adjacent row of the pair, and there is a general alignment of the pores in oblique columns along the length of the thallus.

The bore or interior of the thallus cylinder is annulated by prominent verticillate whorls or sporangial rings, integrally calcified to each other, and consisting of deep furrows bounded by strong ridges. Arising from each furrow and projecting into the axial cavity to about the level of the ridge crests is a single row of large tubules or canals. These canals are the primary branches of the whorl, and there are 56 of them in a ring of the paratype (S75b) near the smaller end of the broken thallus. As shown within the wall of the paratype which has been fortuitously exposed in places of natural breakage, each canal leads straight into the sporangial chamber. The ridges on each side of the furrow are thick, relatively high, crimped along the sides, and more or less nodulose along the crest. The sporangial chambers are relatively large (0.071 mm × 0.059 mm), smooth, shiny, suboval in outline, and centered approximately in the middle region of the wall. There are 22 sporangial rings in the thallus of the paratype over a length of 2.65 mm, and 44 rows of external pores for the same length, or two [sterile] secondary branches for each [fertile] primary branch. Unfortunately the internal character of the secondary branches cannot be made out, and it is the manner in which the secondary canals penetrate the walls and their position with reference to

the sporangial chamber that determine the genus. However, the arrangement of the external pores is much like that in the genus *Neomeris,* and this plus the structure of the primary branches, the character of the sporangial chambers, and the general appearance of the thallus tend to sustain that identification as keyed out from the classification by the Morellets (1913, p. 9). To go a step farther, the fact that there is complete calcification of the whorls to form a single solid cylinder suggests that the subgenus of the Venezuelan *Neomeris* may be *Vaginopora.*

Measurements: Holotype (S75a): length of thallus (broken off at both ends) 4 mm; diameter at large end of thallus 1.2 mm; thickness of wall 0.36 mm; diameter of bore 0.48 mm. Paratype (S75b): length of thallus (broken off at both ends) 2.65 mm; diameter at large end of thallus 1.36 mm; diameter at small end 1.25 mm; thickness of wall at small end of thallus 0.24 mm; diameter of bore at small end of thallus 0.77 mm; average diameters of sporangial chamber 0.071 mm × 0.059 mm; average width of annulation from crest to crest in interior 0.12 mm; diameter of orifice of primary branches 0.018 mm to 0.030 mm.

Type locality: North flank of Punta Gorda Anticline, associated with *Lithothamnium* reef at W-23. (See geologic map by Weisbord, 1957). Playa Grande Formation (Maiquetía Member). Two small fragments.

Comparisons: Among the several Recent species of *Neomeris* (see Howe 1909, Taylor 1960, and Johnson 1961) in tropical American waters—*N. dumetosa* Lamouroux, *N. mucosa* Howe, and *N. annulata* Dickie—the new Venezuelan species is closest superficially to *N. annulata.* It differs from *N. annulata,* however, in the thicker wall of the thallus, in the somewhat greater number of external pores per unit length of the thallus, and in the complete calcification and rigid construction of the whorls to form the cylinder of the thallus. The propensity of the thallus of *N. annulata* to separate into disks because of the loose coherence of the whorls when the cuticle is removed, is one of the characters on which *N. annulata* is assigned to the subgenus *Decaisnella.*

In comparing *Neomeris venezuelensis,* n. sp., with other fossil forms of similar morphology, it seems most closely to resemble species that occur in the Middle Eocene (Cuisian, Lutetian, and Auversian Stages) of France, and this is probably due to the fact that a good deal more is known, thanks to the work of Lucien and Jean Morellet, about Eocene species than of those which undoubtedly occur but have not yet been found in late Cenozoic deposits. The particular species of similarity, all of them in the subgenus *Vaginopora,* are *Neomeris scrobiculata* (Gümbel), *N. arenularia* (Munier-Chalmas), and *N. herouvalensis* (Munier-Chalmas). Though generally similar internally, *N. scrobiculata* (Gümbel) from the Cuisian Stage of France, can be distinguished from *N. venezuelensis* by the larger external pores, as can *N. arenularia* (Munier-Chalmas) from the Eocene of Cerro Escamelo, Mexico (Steinmann, 1899), and the Auversian Stage of France. Externally, *N. herouvalensis* (Munier-Chalmas), also from the Auversian Stage of France, is nearly identical with the Venezuelan species, but *N. herouvalensis* is differentiated from *N. venezuelensis* by the thinner wall of the thallus and by the narrow whorls.

Another allied form is the one reported from the Miocene of Santo Domingo by the Morellets (1939, p. 25, pl. 1, fig. 1) as

PLATE 1

Figures Page

1-7. *Neomeris venezuelensis* Weisbord, n. sp. 49
1, holotype (S75a), exterior view of thallus, X 18; 2-7, paratype (S75b); 2, 3, 4, general views of thallus showing external surface, walls, and internal annulations, X 16, X 15, X 28, respectively; 5, view focused on breached wall to show sporangial chambers (right half), X 48; 6, view focused on internal annulations to show projecting tubular primary branches, X 52; 7, close-up of internal annulations and tubules (primary branches), X 100.

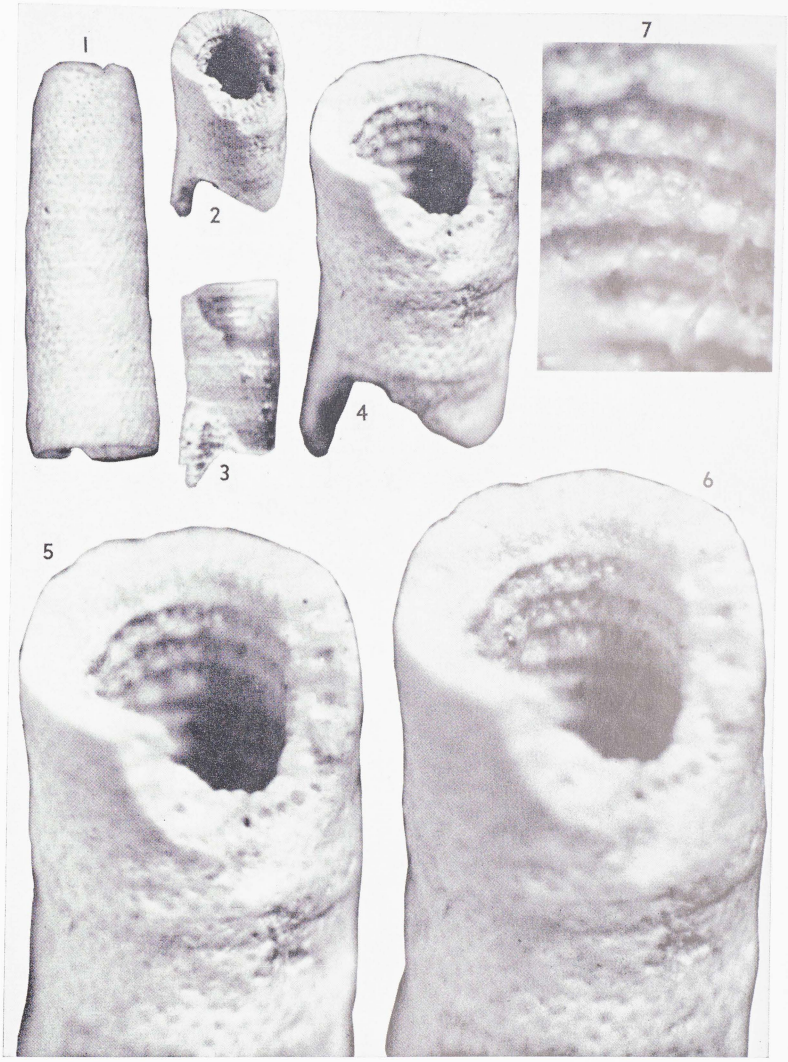

PLATE 1

Neomeris (Vaginopora) sp., but the external pores of that are larger than on the Venezuelan Pliocene species. The Dominican alga is the only other Neogene species of *Neomeris* that is known to the writer in tropical America.

Remarks: The photographs of *Neomeris venezuelensis,* n. sp., were taken and processed by Hal F. Riehle and by Ken Richards, photographer, Florida State University. The types are presently kept in the Department of Geology, Florida State University, Tallahassee, Florida, U. S. A.

Acknowledgments: The writer is indebted to the National Science Foundation for the support it has given him in his study of the Late Cenozoic fossils from northern Venezuela. This is one of a number of papers resulting from that study. The writer also wishes to thank Dr. Richard Rezak of Shell Development Company for his review of, and comments on, the original manuscript of this work.

References

Howe, M. A., 1909, Phycological studies—IV. The genus *Neomeris* and notes on other Siphonales: Torrey Botan. Club, Bull., v. 36, p. 75-104, pls. 1-8, text-figs. 1-3, tables 1-6.

Johnson, J. Harlan, 1961, Limestone-building Algae and algal limestones: Boulder, Johnson Publ. Co., xi + 297 p., 139 pls., 14 tables.

Johnson, J. Harlan, and H. V. Kaska, 1965, Fossil Algae from Guatemala: Colorado School of Mines, Prof. Contrib., no. 1, xii + 152, p., 47 pls., 44 tables, index map.

Morellet, L., and J. Morellet, 1913, Les Dasycladacées du Tertiaire Parisien: Soc. Géol. France, Mém., no. 47, p. 1-43, pls. 1-3, text-figs. 1-24.

Morellet, A., and J. Morellet, 1922, Nouvelle contribution à l'étude des Dasycladacées Tertiaires: Soc. Géol. France, Mém., no. 58, p. 1-35, pls. 1-2 (9-10), text-figs. 1-6.

Morellet, A., and J. Morellet, 1939, Tertiary siphoneous Algae in the W. K. Parker collection with descriptions of some Eocene Siphonae from England: London, British Mus. (Nat. Hist.), ix + 55 p., pls. 1-6, text-figs. 1-7.

Rezak, R., 1959, Studies of Silurian (Gotlandian) Algae. Part II. New Silurian Dasycladaceae from the southwestern United States: Colorado School of Mines Quart., v. 54, no. 1, p. 115-129, pls. 1-4.

Steinmann, G., 1899, Ueber fossile Dasycladaceen vom Cerro Escamela, Mexico: Botan. Zeit., v. 8, p. 151-154, text-figs. 19-21.

Taylor, W. R., 1960, Marine Algae of the eastern tropical and subtropical coasts of the Americas: Univ. Michigan Studies, Sci. ser., v. 21, p. 1-870, pls. 1-80.

Weisbord, N. E., 1957, Notes on the geology of the Cabo Blanco area, Venezuela: Bull. Amer. Paleontology, v. 38, no. 165, p. 1-25, geol. map.

Weisbord, N. E., 1962, Late Cenozoic gastropods from northern Venezuela: Bull. Amer. Paleontology, v. 42, no. 193, p. 1-672, pls. 1-48, text-figs. 1-2.

Weisbord, N. E., 1964, Late Cenozoic pelecypods from northern Venezuela: Bull. Amer. Paleontology, v. 45, no. 204, p. 1-564, pls. 1-59, photogr. figs. 1-8.

December 29, 1966

ERRATUM

VOLUME 4 (1965-1966)

No. 3—pages 128 and 130 were inadvertently interchanged. The explanation for Plate 4 (p. 128) is that for Plate 5; the explanation for Plate 5 (p. 130) is that for Plate 4.