Florida Scientist

QUARTERLY JOURNAL OF THE FLORIDA ACADEMY OF SCIENCES

Walter K. Taylor, *Editor* Henry O. Whittier, *Editor*

Volume 41 Winter, 1978 No. 1

A NEW RECORD OF *ACETABULARIA CALYCULUS* FROM FLORIDA

N. J. EISEMAN, M. C. BENZ, AND D. E. SERBOUSEK

Reprinted from
Florida Scientist
Vol. 41, No. 1, Winter, 1978

A NEW RECORD OF *ACETABULARIA CALYCULUS* FROM FLORIDA[1]

—*N. J. Eiseman, M. C. Benz, and D. E. Serbousek,* Harbor Branch Foundation, RFD 1, Box 196, Ft. Pierce, Florida 33450

ABSTRACT: Acetabularia calyculus *is reported from lagoons on the Florida East Coast.*°

FIVE SPECIES of the genus *Acetabularia* Lamouroux have been previously reported from Florida, *A. crenulata* Lamouroux, *A. (Chalmasia) antillana* (Solms-Laubach) Egerod, *A. pusilla* (Howe) Collins, *A. (Acicularia) shenkii* Mobius, and *A. farlowii* Solms-Laubach (Taylor 1928, 1960). *Acetabularia calyculus* Quoy & Gaimard was collected by the senior author January 7, 1971 in Jupiter Sound (26°57.2′N, 80°04.4′W) and by the junior authors on April 5, 1976 in the Indian River north of Ft. Pierce Inlet (27°31.8′N, 80°20.25′W). Both sites are part of the coastal lagoon system of the Florida East Coast. In both cases the plants were growing on rocks and loose shells near the low water mark. Some plants in both collections were in reproductive condition.

Acetabularia calyculus is readily distinguished from the other Florida species by the deeply cup-shaped cap (Fig. 1) and by the ends of the rays which are broadly notched (Fig. 2). The caps of the other species are flat, irregular, or only slightly concave with rays that are rounded or apiculate. The caps in our specimens are 4.0-4.5 mm in diameter, 2.0-2.5 mm deep, and have 21-30 rays. Calcification of the cap is very light. The stalks are 2.0-3.5 cm tall, 250 μm in diameter and more heavily calcified. The gametangial cysts are 100-125 μm in diameter. The corona superior in our specimens has two hair scars in a radial line from the axis of the plant (Fig. 3). The lobes of the corona inferior are broadly rounded (Fig. 4).

Acetabularia calyculus has been described in detail from Australia, the type locality (Solms-Laubach 1895), the Virgin Islands (Bφrgesen 1913), and Jamaica (Collins 1909). They report that cap diameter may reach 7 mm. They also report that there may be three hair scars on the corona superior in a triangular or irregular arrangement, or rarely four hair scars. As mentioned above, our specimens have only two hair scars. The caps are also slightly smaller than other reported specimens but are otherwise typical of the species.

---

[1]Contribution No. 92, Harbor Branch Foundation, Inc.

°The costs of publication of this article were defrayed in part by the payment of charges from funds made available in support of the research which is the subject of this article. In accordance with 18 U.S.C. § 1734, this article must therefore be hereby marked "*advertisement*" solely to indicate this fact.

species of pelecypods that have adopted the shell-cemented habit. The question then arises, why have not more genera and species of pelecypods adopted shell cementation? There are at least four answers to this question. 1) It would be impossible for shell-cemented pelecypods to be deposit feeders because these animals must be able to move around in or on the bottom in search of nutriment. Furthermore, deposit-feeding pelecypods live on a soft bottom, which is unsuitable for shell-cemented pelecypods. Consequently, the Protobranchia, the Tellinidae, and the Semelidae, all of which are deposit feeders, cannot be shell-cemented. Because shell-cemented pelecypods are sessile and benthic, they are generally limited to suspension feeding. 2) The temperature of the water is another important factor. Shell-cemented pelecypods thrive in warm water and are absent from the Arctic, Antarctic, and deep-sea (2,000 m or greater depth) faunas (Nicol, 1967). Even the Ostreidae, which can live in colder water than can the other shell-cemented groups, do not invade areas where the sea water is less than 10° C during the warmest month of the year. The 3 species of freshwater shell-cemented pelecypods are tropical. 3) Yonge (1967) pointed out that the inhalent and exhalent currents must be widely separated in shell-cemented pelecypods because they commonly live in turbulent water, and this physical factor would help to prevent waste material from entering the inhalent opening. 4) Probably the most important factor is that many pelecypods are attached by a byssus, and there is no compelling necessity for them to become shell cemented. The byssally attached pelecypod species, including the Anomiidae which are attached by a calcified byssus, considerably outnumber the shell-cemented species in living faunas, and they appear to have done so in the past. Certainly these four limiting factors can explain why the pelecypods have not used shell cementation more commonly as an adaptation to a sessile mode of life.

LITERATURE CITED

Moore, R. C. (ed.). 1969, 1971. Treatise on Invertebrate Paleontology. Part N, Mollusca 6, Bivalvia. Vols. 1-2, 1969, Vol. 3, 1971. Geol. Soc. Amer. Boulder, Colorado.

Newell, N. D., and D. W. Boyd. 1970. Oyster-like Permian Bivalvia. Bull. Amer. Mus. Nat. Hist. 143(4):219-281.

Nicol, D. 1967. Some characteristics of cold-water marine pelecypods. J. Paleont. 41:1330-1340.

Yonge, C. M. 1962. On *Etheria elliptica* Lam. and the course of evolution, including assumption of monomyarianism in the family Etheriidae (Bivalvia: Unionacea). Phil. Trans. Roy. Soc. London, Ser. B., Biol. Sci., No. 715, 244:423-458.

_____. 1967. Form, habit and evolution in the Chamidae (Bivalvia) with reference to conditions in the rudists (Hippuritacea). Phil. Trans. Roy. Soc. London, Ser. B., Biol. Sci., No. 775, 252:49-105.

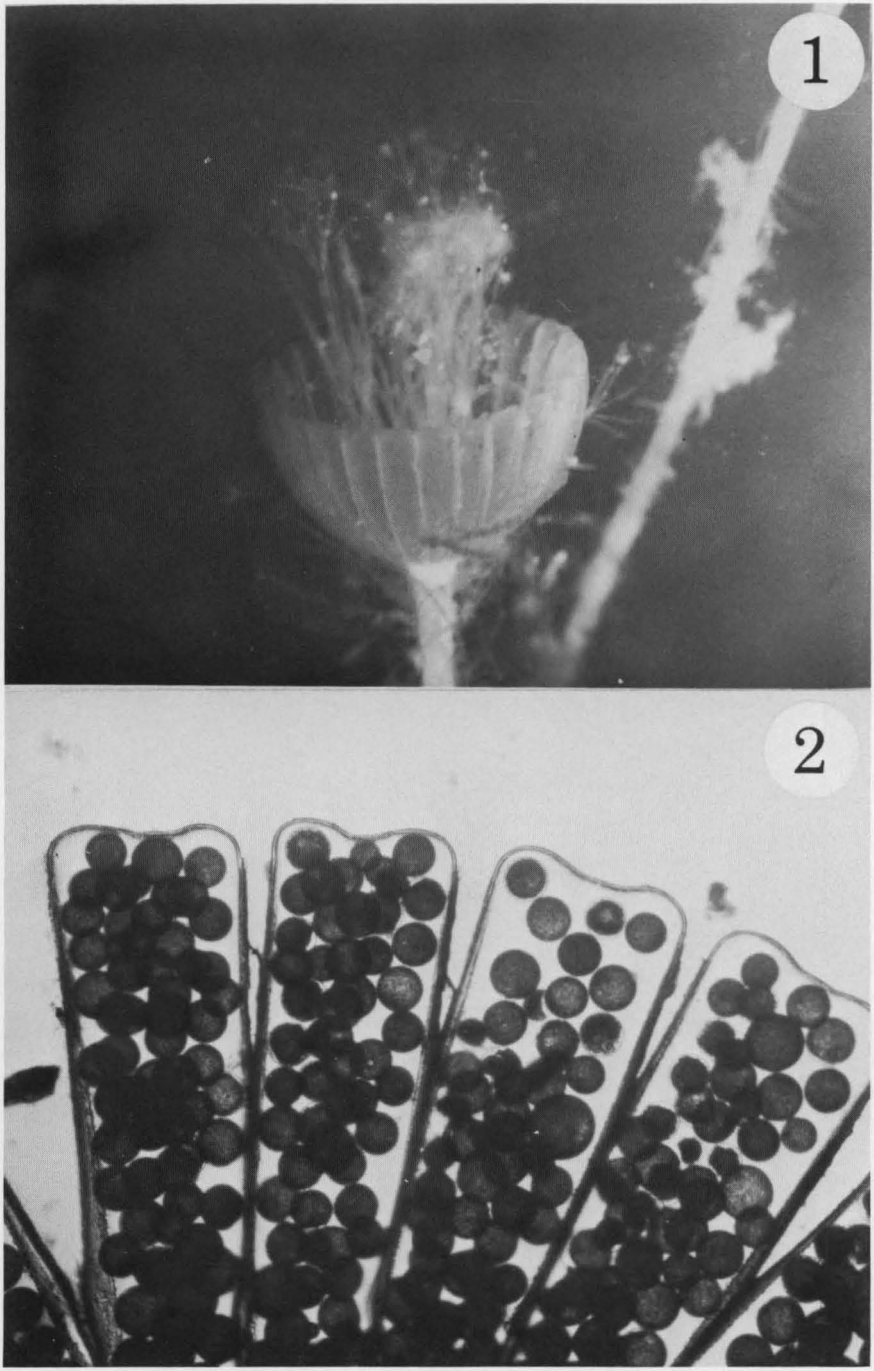

FIG. 1. Habit of a cap with the coronal hairs attached.
FIG. 2. Detail of the rays showing broadly notched ends and gametangial cysts.

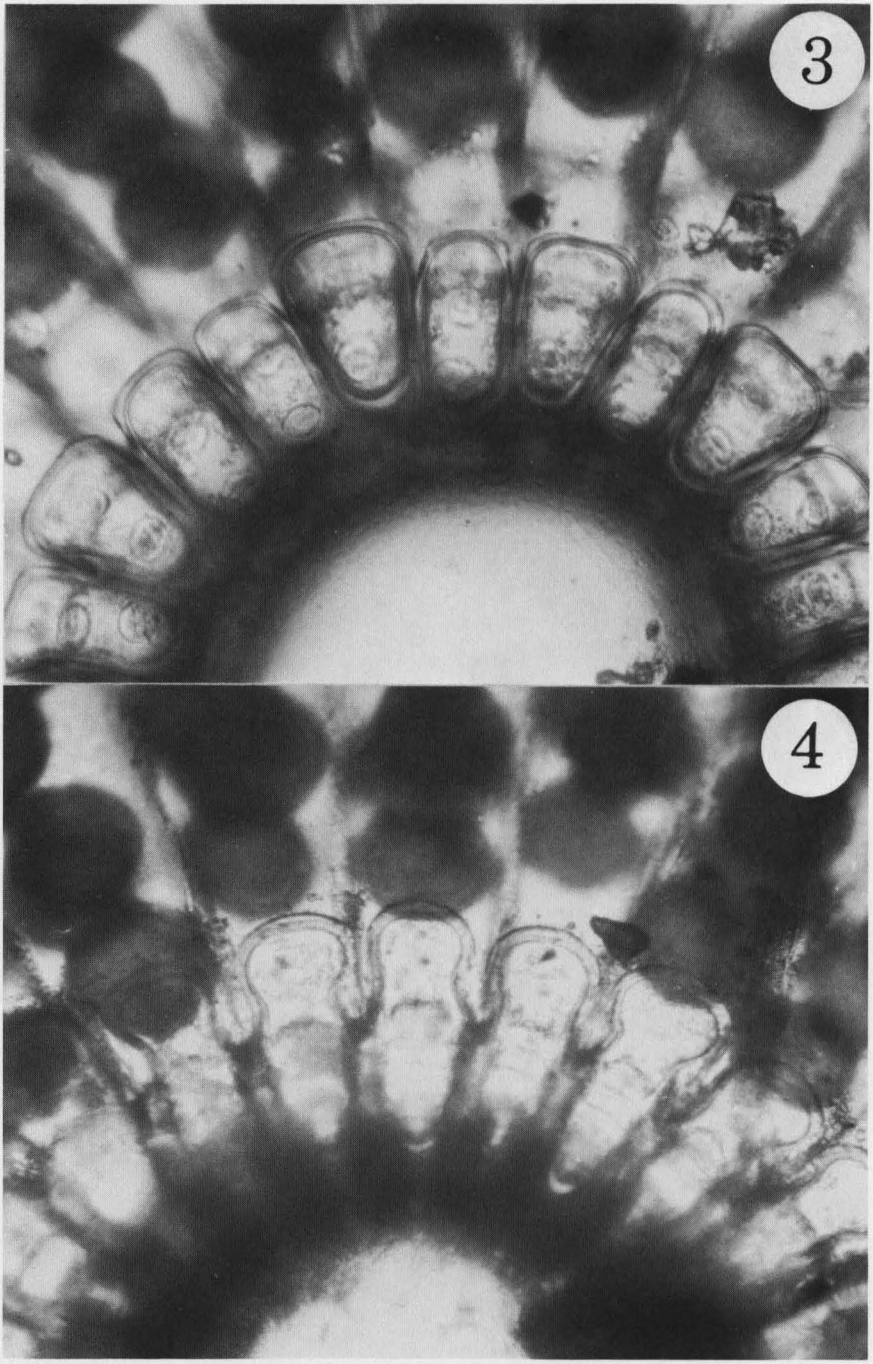

FIG. 3. Detail of the corona superior showing the lobes with two hair scars.
FIG. 4. Detail of the corona inferior showing the broadly rounded lobes.

LITERATURE CITED

BØRGESEN, F. 1913. Marine algae of the Danish West Indies. I. Chlorophyceae. Dansk Bot. Arkiv 1(4):1-158.

COLLINS, F. S. 1909. The green algae of North America. Tufts Coll. Stud. 2:69-480, pls. 1-18.

SOLMS-LAUBACH, H. 1895. Monograph of the Acetabularieae. Trans. Linn. Soc. London, Bot. Ser 2, 5:1-39, pls. 1-4.

TAYLOR, W. R. 1928. Marine algae of Florida with special reference to the Dry Tortugas. Carnegie Inst. Wash. 25(Publ. No. 379):1-219, pls. 1-37.

_____. 1960. Marine Algae of the Eastern Tropical and Subtropical Coasts of the Americas. Univ. Mich. Press. Ann Arbor.

Florida Sci. 41(1):42-45. 1978.