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# THE SCLERACTINIAN CORAL *ARCHOHELIA* LIVING ON THE COASTAL SHORES OF QUEENSLAND, AUSTRALIA

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## SUMMARY

Live colonies of the oculinid genus *Archohelia* Vaughan, previously known only from the fossil records of the West Indies and Central and North America, have been discovered in shallow water off Rat Island on the coast of Central Queensland, Australia.

*Archohelia rediviva* n. sp. differs from the genotype *A. limonensis* in having the tertiary septa regularly fused to the six secondary septa. The small white colonies of *A. rediviva* with branches up to 10 cm long grow more or less erectly from thin encrusting bases. They occur in 3.5 metres of sheltered, turbid water by the shoreline of a rocky island having no fringing coral reef. The coral is subject to strong tidal currents and large changes in salinity.

There are no hints as to the provenance of this coral from the other occurrences of this genus or *Oculina* in Australia.

## INTRODUCTION

The oculinid genus *Archohelia* Vaughan, distinguished from *Oculina* only by the presence of a persistent axial corallite similar to that of *Acropora*, has been thought to be extinct. It has been previously known from the Upper Cretaceous of New Mexico, represented by a number of species in the Eocene of California, Barbados and the Gulf Coast region of the United States, by several species in the Oligocene of the Gulf Coast and the State of Washington, and made a last appearance in the Pliocene of Costa Rica, Florida and California (Durham, 1942; Hertlein and Grant, 1960; Vaughan, 1919, 1927, 1941; Wells, 1933, 1945).

That this genus is neither extinct nor peculiar to the Americas is evidenced by the surprising discovery by the junior author in 1974 of several living colonies of *Archohelia* at Rat Island, Gladstone Harbour, Queensland, the subject of this notice.

## SYSTEMATIC ACCOUNT

Order       SCLERACTINIA  
Suborder   FAVIINA  
Family      OCULINIDAE  
Genus       *Archohelia* Vaughan 1919

Type species — *A. limonensis* Vaughan 1919. Pliocene Costa Rica.

“*Archohelia* differs from *Oculina* solely by having a persistent axial corallite, whereas in *Oculina* there is no axial corallite. Pali or paliform teeth are present on all but the last

cycle. Columella trabecular, with some papillae on its upper surface." (Vaughan, 1919, p. 352.) The generic validity of this single criterion — presence of the axial corallite — is open to some doubt. Although the genus *Acropora* has characteristically a leading (axial) corallite on branch tips in nearly all of its 100 or more species, in several massive species (subgenus *Isopora* of some authors) the apparent lack of axial corallites may be due to the massive mode of growth producing an obliteration, whereas all species of *Oculina* and *Archohelia* have the branching growth habit. For the present *Archohelia* may be provisionally retained as a separate genus.

***Archohelia rediviva* n. sp.**

Fig. 1, a-c; Fig. 2, a-e

**DESCRIPTION:** Corallum composed of relatively slender (width 5-10 mm) branches up to 10 cm long, with many secondary branchlets, rising from an encrusting base, the whole forming a bushy colony. Calices elevated only 0.5 mm on older branches but up to 3 mm on rapidly growing ones, spaced 2-5 mm apart. Coenosteum dense, very faintly striated and granular, quite smooth on older, thicker branches, weakly costate near calices. Axial calices 3 mm in diameter, radials 2-2.5 mm. Septa of axial and radial corallites arranged regularly in three cycles (6/6/12) with several fourth cycle septa in the largest calices. Third cycle septa regularly united to the second cycle with a well-defined paliform lobe at each junction, and weaker lobes before the first cycle. All septa scarcely exsert, those of the first cycle slightly more prominent. In the axial corallites at tips of rapidly growing branches the septa are thin, with paliform lobes and columellar papillae very weakly developed or absent. Major septa with smooth margins and sides laterally spinulose. Higher cycle septa marginally finely dentate, becoming smooth in older calices.

**HABIT:** Colonies branching more or less erectly from thin, white, irregularly shaped, encrusting bases, up to 15 cm across, possessing randomly spaced corallites.

**MATERIAL EXAMINED:** Australian Museum No. G14745 (four pieces from one colony); Queensland Museum, four specimens, Nos. G9833-36.

**HOLOTYPE:** Queensland Museum No. G9834.

**PARATYPES:** Queensland Museum Nos. G9833,35,36; Australian Museum No. G14745.

**LOCALITY:** East side of Rat Island off Gladstone, between Curtis Island and Facing Island, Queensland, Lat. 23°46'S, Long. 151°19'E. Depth 3.5 m. Growing under overhanging rock in sheltered water. Colour of living colonies white. Collected by P. Alderslade, August 1974.

**OCCURRENCE**

The colonies of *A. rediviva* were discovered at an island close to the central Queensland coast. This locality is composed of the same rock type as the mainland and has no fringing coral reef. The sea water in this locality is quite different from that of the coral reef zone, some 20 miles to the east, being turbid for most of the year and subject to large and rapid changes in salinity during the rainy season.

Rat Island is situated in a narrow water passage which forms a major route of exchange between the water of Port Curtis and that of the open sea. With tide heights in excess of 4 m, the island's shores are subject to currents of considerable velocity. On the seaward side of this island there is an indentation into the rocky shoreline, roughly 'U' shaped,

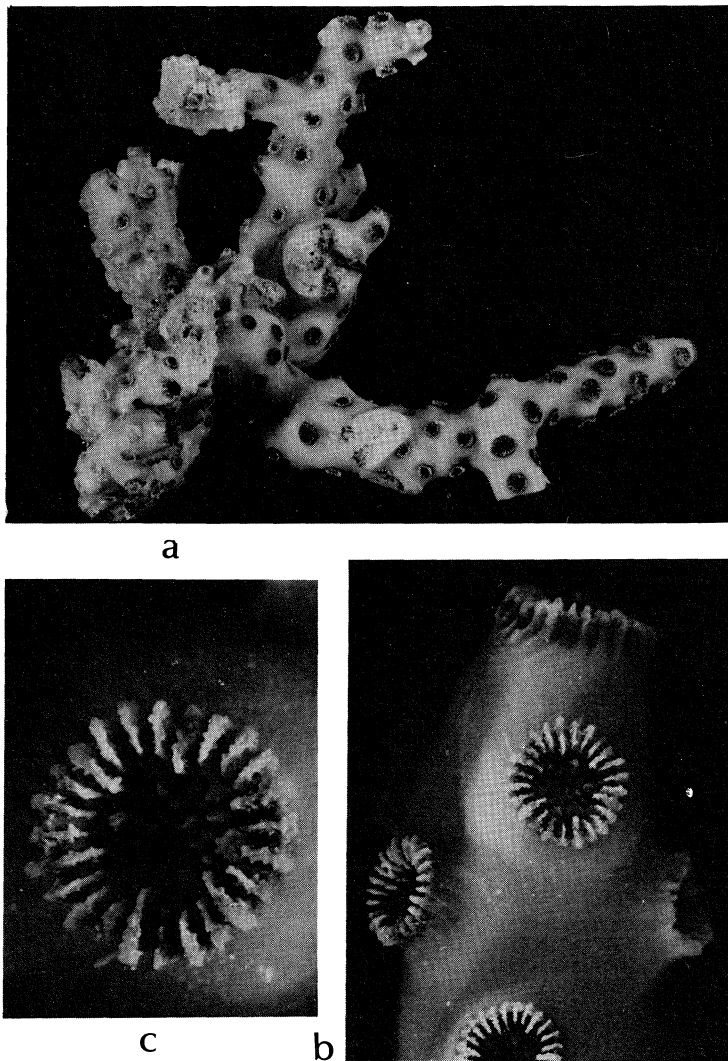


Figure 1

*Archohelia rediviva* n. sp. Holotype, Queensland Museum G.9834, Rat Island, Queensland.

a: General aspect, x1.

b: Tip of branch with large axial corallite and several radial corallites, x6.

c: Radial calice, x14.

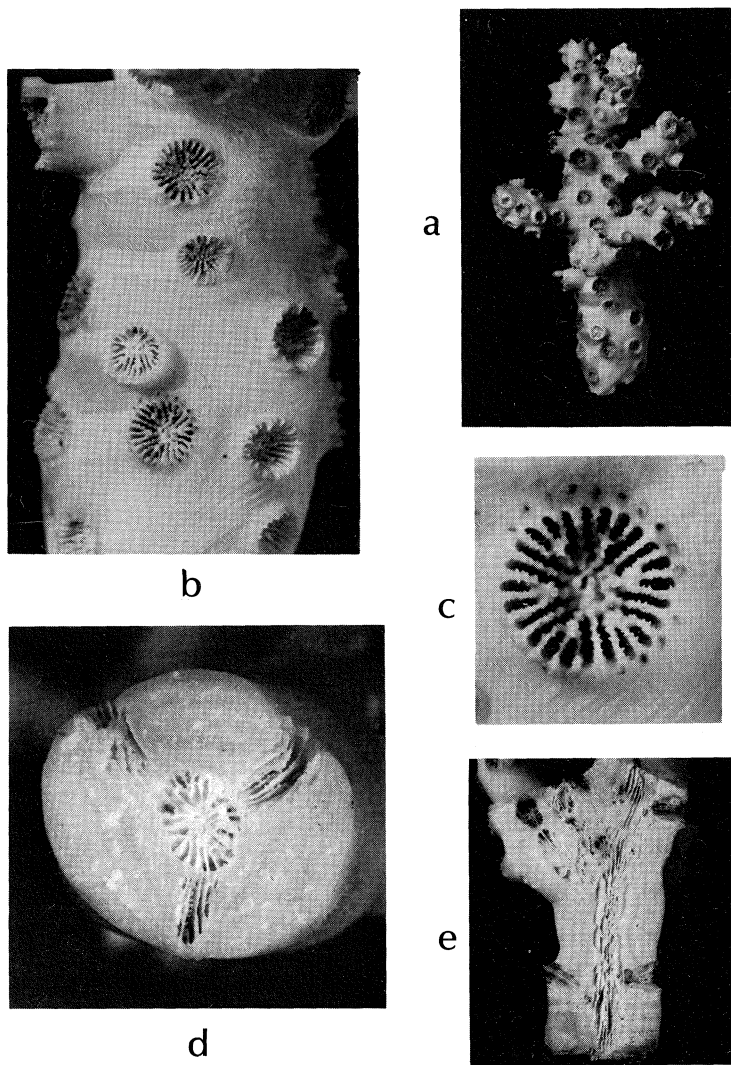


Figure 2

*Archohelia rediviva* n. sp. Rat Island, Queensland.

- a: Branch with branchlets. Paratype, Australian Museum G.14745, x1.
- b: Lower part of branch of Figure a, x4.
- c: Radial calice at lower part of Figure b, x10.
- d: Transverse aspect of main branch of Figure a, showing axial corallite with three radial offsets, x4.
- e: Longitudinal section of branch. Paratype, Queensland Museum G.9836, x1.6.

approximately 7 m across, 14 m long and up to 5 m deep at low tide. The rim of this cavity is submerged at high tide. Towards the bottom and rear of this hole, under rocky overhangs, occur the *A. rediviva* colonies, in close proximity to several species of brown algae and numerous sponges. In this position the water currents are possibly reduced and the colonies are afforded considerable protection from direct wave activity during periods of rough weather. Several years ago flourishing stands of a species of *Acropora* grew nearby. A large fresh and/or pollution from the local heavy industry may have contributed to its death, and the skeletons are now encrusted with sponges and algae. This environmental change, resulting in the disappearance of the hermatypic *Acropora* may not have affected the ahermatypic (lacking zooxanthellae) *Archohelia* that survives.

#### DISCUSSION

While *A. rediviva* is regarded as a new species, comparisons with the older extinct Cenozoic species are difficult. Most fossil species of the genus are based on broken and worn parts of branches. The youngest of these and the type of the genus, *A. limonensis*, is only slightly different from *A. rediviva*, the sole apparent difference being that the tertiary septa of *A. limonensis* are usually free at their inner ends, as they are in the dozen or so older species, whereas they are regularly fused to the six septa of the second cycle in *A. rediviva*.

For the most part, taxonomic studies of corals from this region of Australia have been based on collections from the offshore coral reefs and not from waters close to the mainland. That this new species has not been noted before may therefore indicate that it will be found to be restricted to shallow mainland waters or the rocky islands close to the mainland. As to the provenance of this stranger in Queensland waters, there are no hints from other occurrences of the genus or its very close relative *Oculina* in Australia. Thus far the only record of *Oculina?* or *Archohelia?* sp. is a few fossil fragments from the Tertiary of the Langley Park Bore, Perth (Wells, 1942) (*Oculina fasciculata* Saville Kent from the Great Barrier Reef is an *Echinopora*). The nearest other record of *Oculina* is from the Miocene to Recent in New Zealand (Squires, 1958; Ralph and Squires, 1962; Squires and Keyes, 1967). The next nearest record is *A. limonensis* in the Pliocene of Costa Rica. *Oculina remondi* Philippi from the Miocene (or Pliocene) of Caldera, Chile (Möricke, 1896), poorly known, may be an *Archohelia*. There is some analogy with the mysterious appearance near Savona, Italy, of a thriving colony of *Oculina*, referred to *Oculina patagonica* de Angelis by Zibrowius (1974). This is the only record of this genus in the Mediterranean and it is unknown in the Eastern Atlantic although a relative, *Schizoculina*, occurs uniquely in the Gulf of Guinea. *Oculina patagonica* was previously known only from subrecent strata in Argentina. Zibrowius found no plausible explanation of this erratic occurrence, as inexplicable at present as *Archohelia* living in Australia.

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