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AGGREGATED CHARACTER OF THE COLONY IN *CATENIPORA* AND *HALYSITES*

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The proper colony form of *Catenipora* and *Halysites* is a single chain, which never branched, budding in these corals being terminal and singular. The buds never appeared on lateral walls nor on the junctions between the neighbouring corallites. The chains, singular at first, later on joined together accidentally, forming an aggregate colony, which was built by several generations of planulae. The corallite structure and offsetting are typical of *Tabulata*.

Key words: *Tabulata*, astogeny, systematics, Silurian.

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INTRODUCTION

Some authors (Mironova 1974, Jenkins 1975, Klaamann 1975, Preobrazhensky 1979) have lately suggested that, at least some genera of *Halysitida* should be assigned to the *Heliolitoidea*. This suggestion is based on the supposedly coenenchymal budding mode in *Halysites* and *Cystihalysites*. I described earlier (Stasińska 1967) the development and colony structure in Silurian species of *Catenipora* and *Halysites*, but the present investigation of new and more complete material by means of serial sectioning throws a new light on these problems.

The investigations were carried out on the colonies of *Halysites junior* Klaaman, 1961. The material is housed in the Naturhistoriska Riksmuseets in Stockholm (RM); series of peels are housed in the Institute of Paleobiology, Polish Academy of Sciences, Warszawa.

DEVELOPMENT OF THE COLONY

In *Catenipora* and *Halysites*, growth of a colony begins with a protocorallite which resembles that of *Aulopora* in shape and structure, and was attached to the substrate (Stasińska 1967: pl. 34: 1, 5). As in *Aulopora* (Stasińska 1974: fig. 1), the first bud formed within the wall of a calice on the side which was attached to the

substrate, but with the difference that in *Catenipora* and *Halysites*, budding was always singular. A thick, distinctly delimited wall formed between the protocorallite and the daughter corallite in *Catenipora*, and in *Halysites*, a wide tube formed there within which diaphragms appeared.

Later budding proceeded in the same manner. The daughter corallite appeared always singularly and on the basal side of the wall. A characteristic chain formed, which elongated by intensive budding at the distal end; it was invariably the

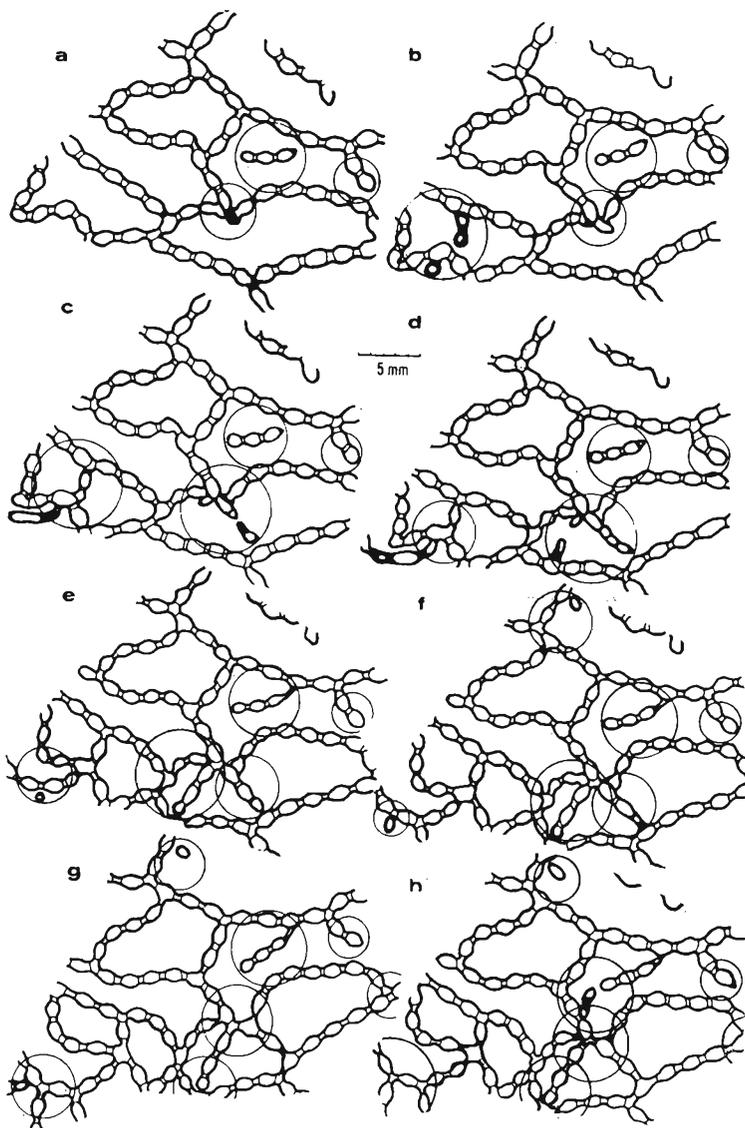


Fig. 1. *Halysites junior* Klamann, Island of Gotland, RM-19957: a—h series of transverse sections (peels) through the fragment of a colony, showing appearance of new chains; a—h distance 10 mm.

youngest corallite which budded. Budding occurred at the early development stage of the corallite, then, the parent corallite declined and grew upward. The upward-growing corallites had no possibility of budding new individuals. They could propagate exclusively by planulae. Thus, the proper colony form in *Catenipora* and *Halysites* is a single chain which never branches into daughter chains. The size and shape of corallites in the chain are characteristic for a given species. The septal spines and tabulae appeared very early. The wall or tabulae of the tubes connecting the corallites were, in my opinion, bases of the horizontal, soft-tissue tubes, which connected the polyps. This constitutes the essential difference between genera *Catenipora* and *Halysites* and the genus *Aulopora*; in the latter the corallites after budding-off lost their connections with the parent corallites. The chains settled on the substrate close to each other but independent at first, then later joined. The corallites ending the chains joined other chains by fusing at accidental places with their corallites — at the wall or at the intercorallite zones. At the points of connection, the corallites became covered with a common epitheca. The corallites of the fused chain grew only upward and propagated sexually.

New chains often appeared in the lacunae as a result of planulae settling on the sediment infilling the lacunae. The aggregate colonies were built of several interconnected chains developed from several generations of planulae. The size of lacunae depended on the age of a colony. In young colonies lacunae were long and large. In adult colonies they were small, because of the chains which developed from planulae of successive generations, which settled within lacunae.

Colonies formed from more than one planula were described in fossil and Recent corals (Koch 1892; Duerden 1902; Fedorowski 1980). Duerden (1902), who observed settling of the planulae of corals at the West Indian shores, stated that there were differences between the species in the speed and range of spreading of the planulae. After being released by the polyps, the planulae of some species were quickly transported by the currents over a long distance. However, in the majority of the species, the planulae subsided quickly and settled on the sea bottom in the immediate neighbourhood. The colonies thus initiated fuse and form aggregates.

CONCLUSIONS

1. Budding in *Catenipora* and *Halysites* occurred exclusively within the calice of the youngest corallite in the chain;
2. the buds never appeared on the lateral wall nor on the junction between the neighbouring corallites, thus the connecting tissue between the corallites had nothing in common with the coenenchyme of the heliolitoids;
3. the connections were most probably by the bases of the soft-tissue tubes which joined the neighbouring corallites.

It follows that the structure and mode of budding in *Catenipora* and *Halysites* were typical of Tabulata, and these genera cannot be assigned to Heliolitoidea.

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