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Microstructural diversity of the stylophyllid (Scleractinia) skeleton

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Coralla of the three species of solitary corals described herein from the Sinemurian (Lower Jurassic) of Sicily, i.e., *Haimeicyclus haimei* (Chapuis and Dewalque, 1853), *Stylophyllopsis* sp. cf. *S . rugosa* (Duncan and Wright, 1867), and *Stylophyllopsis* sp. A., conform to the overall stylophyllid morphology. Their septa consist of spines that are increasingly covered with sclerenchyme and low in the calice form compact blades. The pattern of diagenetic alteration of septa is diverse but consistent within particular taxa. It suggests that the spectrum of the original microstructures is wider than traditionally suggested for stylophyllids. In *H. haimei*, the septa are covered with dense granulations and completely recrystallized. Granulations also cover septal faces of *Stylophyllopsis* cf. *rugosa* and have rod-like foundations. In *Stylophyllopsis* sp. A., vestiges of the narrow mid-septal zone (similar to that in minitrabecular corals) occur in the proximal part of larger septa, whereas septal spines which are similar to those in *Stylophyllopsis* cf. *rugosa* occur in their distal parts. Similar diversity of microstructures is reported also in Triassic stylophyllids that have aragonitic coralla. The presence of distinct septal spines along with wide-ranging microstructural diversity of traditional Triassic Jurassic stylophyllids, casts light on their possible evolutionary relationships, and can be a useful criterion for further revision of the group. For example, Jurassic thecocyathids, considered ancestral to caryophylliinans, share similar spiny/lobate septa with stylophyllids. Also Recent deep-water anthemiphylliids with spiny/lobate septa are strikingly similar to stylophyllids. Although this may be another example of parallel evolution, the separation of anthemiphylliids from other scleractinian clades on a mitochondrial 16S RNA tree topology suggests their ancient roots and enable us to suggest a stylophyllid ancestry. The supposed cyclic pattern of protoseptal insertion in Early Jurassic *H. haimei* supports the hypothesis of scleractinian-like (and not rugosan) ancestory of the stylophyllid evolutionary lineage.

Key words: Scleractinia, Stylophyllina, ontogeny, microstructure, Jurassic, Sinemurian, Sicily.

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