ACTA PALAEONTOLOGICA POLONICA

A model for furcate septal increase in a Triassic scleractiniamorph

Jarosław Stolarski, Ewa Roniewicz, and Tomasz Grycuk
Acta Palaeontologica Polonica 49 (4), 2004: 529-542

Triassic corals with septa that branch repeatedly and centripetally are here assigned to a new genus *Furcophyllia*. Septa of *F. septafindens* (Volz, 1896), re-described from the Italian Dolomites, are composed of 3-10 blades ('septal brooms'). Distances between adjacent septa and their branches are equal, and the thickness of all blades is approximately the same throughout ontogeny. However, none of the septal brooms show the same branching pattern. Proposed herein is a simple computer model that reproduces septal pattern, similar to that of *Furcophyllia*, based on a minimal set of rules: (i) uniform coverage of intra-calicular space; (ii) regular bifurcations following some probability; (iii) keeping some minimal distance between septal branches. The elaborate septal pattern of *Furcophyllia* suggests a distinct organization of the polyp's soft tissue, especially mesenteries whose appearance in modern corals is associated with insertion of sclerosepta. Hypothesis 1 suggests that mesenterial pairs flanked only 'septal brooms' and that septal branches functionally corresponded with septal microarchitecture. Hypothesis 2 suggests that mesenterial pairs developed between all septal branches that functionally correspond with conventional septa. Delicate menianae, which developed on *Furcophyllia* septal faces (and many other Triassic corals) resemble similar septal microarchitecture of the Recent agariciid *Leptoseris fragilis* and may be closely related to the suspension feeding strategy of this coral. The furcate septal arrangement in *Furcophyllia* is unique among Triassic corals, and generally, among Mesozoic and Cenozoic corals. The only analogous corals are Cretaceous aulastraeoporids (e.g., *Preverastrea*, *Paronastraea*), *Trochoidomeandra*, and some Jurassic rhipidogyrids having secondary (apophysal) septal branches. In some Recent caryophylliids (*Trochocyathus rhombocolumna*, *Phacelocyathus flos*) primary septa may also split dichotomously and centripetally.

Key words: Scleractinia, septal growth, computer model, Triassic, Dolomites, Italy.

Jarosław Stolarski [stolacy@twarda.pan.pl] and Ewa Roniewicz [eron@twarda.pan.pl], Instytut Paleobiologii, Polska Akademia Nauk, Twarda 51/55, 00–818 Warszawa, Poland; Tomasz Grycuk [grycuk@biogeo.uw.edu.pl], Zakład Biofizyki, Instytut Fizyki Doświadczalnej, Uniwersytet Warszawski, Żwirki i Wigury 93, 02–089 Warszawa, Poland.


Full text (2,914.1 kB)