

Astogeny and Hystero-Ontogeny in a Permian *Szechuanophyllum* Coral

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Background and Aim: Corallites in colonial corals reproduce both sexually and asexually. Protocorallite ontogeny and initial growth stage of colony development in waagenophyllids have not yet been understood. The intention here is to investigate protocorallite ontogeny, corallite increase, and relationship between protocorallite and its derived offsets of a Permian waagenophyllid *Szechuanophyllum denticulatum*.

Methods: This research is mainly based on using peel method.

Results: Protocorallite of studied colony is the largest corallite that displays asexual reproduction by means of budding. Increase occurs in peripheral part of dissepimentarium, with no preferred position with respect to the axial plane of protocorallite. Elongation of parental septa toward periphery and lateral conjoining at their peripheral ends, have been considered as clues for increase, offsetting is intracalicular and there is a space competition between parent and offsets. Initially each offset is bounded by parts of the protocorallite wall, while a new wall forms on the side toward the parent axis. Offsets build on the protocorallite structure and offset septa subsequently develop on the new wall. In pre-increase stage, protocorallite septa are dilated and elongated toward periphery, peripheral ends of adjacent septa are conjoined, protocorallite wall at the increase sector becomes thick, whereas lonsdaleoid dissepiments were enlarged, one of the previously discontinued parts of metasepta, which are inherited as atavo-tissue by offset, plays the role of cardinal septum.

Discussion and Conclusion: Dividing wall is derived by apparent modification of lonsdaleoid dissepiments of the parent and strengthened by peripheral ends of newly inserted septa. However, double and/or triple walls, which may be temporarily present, could be caused by coralla contraction, leads to hollow space that is consequently occupied by offset outgrowth. Earlier produced offsets do not necessarily attain larger diameter and higher reproduction potential. Any larger corallites tend to reproduce more offsets in turn, implying that offsetting is even controlled by parental size, offsetting appears in specific parts, where rates of septal insertion and corallite growth are higher, leading to the development of lonsdaleoid dissepiments. Hollow space is a product due to rejuvenescence in response to environmental changes.