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## CTENOID ORGAN IN *LAGYNOCYSTIS* (STYLOPHORA) MAY BE AN ADAPTATION TO THE DEEP-SEA BY CHEMOSYNTHETIC SYMBIOSIS

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Stylophorans are a group of enigmatic Paleozoic echinoderms. Among them, the mitrate *Lagynocystis pyramidalis* stands out due to its unique morphology and its mysterious internal ctenoid organ. This taxon is of particular interest not only because of its wide paleobiogeographical distribution (Avalonia, Baltica, high-latitude peri-Gondwanan regions), but also due to its exceptional longevity as a species (late Tremadocian – late Sandbian). *Lagynocystis* is typically found in grey to black shales characteristic of oxygen-poor offshore sediments deposited in quiet distal aphotic settings, as evidenced by its association with blind trilobites. *Lagynocystis* is abundant in silicified nodules in the Šárka Formation (Darriwilian) of the Barrandian area in the Prague Basin (Czech Republic). Despite extensive studies, the function of the ctenoid organ remains unclear, largely due to the challenges of accessing detailed information about this internal structure. It is hypothesized that this organ could be an adaptation to deep-sea conditions, possibly aiding in nutrition, respiration, or housing a colony of chemosynthetic bacteria. To explore this, modern photographic and CT scanning equipment was used to create high-resolution 3D reconstructions of *Lagynocystis* and its ctenoid organ. These new highly detailed reconstructions of the ctenoid organ challenge previous interpretations by revealing it as a possible continuous, pleated tripartite structure rather than a series of bars. This new understanding of its form opens up fresh perspectives on its function and the lifestyle of *Lagynocystis*.