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FUNCTIONAL MICROMORPHOLOGY OF THE ECHINODERM SKELETON

Przemysław Gorzelak
Polish Academy of Sciences



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Functional Micromorphology of the Echinoderm Skeleton

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Przemysław Gorzelak
Institute of Paleobiology, Polish Academy of Sciences

Author for correspondence: Przemysław Gorzelak, pgorzelak@twarda.pan.pl

Abstract: Echinoderms elaborate a calcite skeleton composed of numerous plates with a distinct microstructure (stereom) that can be modeled into different shapes thanks to the use of a transient amorphous calcium carbonate (ACC) precursor phase and the incorporation of an intraorganic matrix during biomineralization. A variety of different types of stereom microarchitecture have been distinguished, each of them optimized for a specific function. For instance, a regular, galleried stereom typically houses collagenous ligaments, whereas an irregular, fine labyrinthic stereom commonly bears muscles. Epithelial tissues, in turn, are usually associated with coarse and dense stereom microfabrics. Stereom can be preserved in fossil echinoderms and a wide array of investigating methods are available. As many case studies have shown, a great deal of important paleobiological and paleoecological information can be encoded by studying the stereom microstructure of extinct echinoderms.

Keywords: Echinodermata, biomineralization, stereom, function, paleoanatomy

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