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Nanostructural and geochemical features of the Jurassic isocrinid columnal ossicles

Jarosław Stolarski, Przemysław Gorzelak, Maciej Mazur, Yves Marrocchi, and Anders Meibom
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Calcite isocrinid ossicles from the Middle Jurassic (Bathonian) clays in Gnaszyn (central Poland) show perfectly preserved micro– and nanostructural details typical of diagenetically unaltered echinoderm skeleton. Stereom pores are filled with ferroan calcite cements that sealed off the skeleton from diagenetic fluids and prevented structural and geochemical alteration. In contrast with high–Mg calcite skeleton of modern, tropical echinoderms, the fossil crinoid ossicles from Gnaszyn contain only 5.0–5.3 mole% of $MgCO_3$. This low Mg content can be a result of either a low temperature environ– ment (ca. 10°C) and/or low Mg/Ca seawater ratio. Both conditions have been proposed for the Middle Jurassic marine environment. Occurrence of Mg–enriched central region of stereom bars of Jurassic columnal ossicle of *Chariocrinus andreae* is consistent with the concept of magnesium ions involvement in earliest growth phases of calcium carbonate biominerals.

Key words: Echinodermata, Crinoidea, calcite, nanostructure, geochemistry, AFM, NanoSIMS, Jurassic

Jarosław Stolarski [stolacy@twarda.pan.pl], and Przemysław Gorzelak [przemyslaw.gorzelak@gmail.com], Institute of Paleobiology, Polish Academy of Sciences, ul. Twarda 51/55, PL–00–818 Warsaw, Poland; Maciej Mazur [mmazur@chem.uw.edu.pl], Department of Chemistry, Laboratory of Electrochemistry, University of Warsaw, ul. Pasteura 1, PL–02–093 Warsaw, Poland; Yves Marrocchi [marrocchi@mnhn.fr] and Anders Meibom [meibom@mnhn.fr], Muséum National d'Histoire Naturelle, Laboratoire d'Etude de la Matiere Extraterrestre, USM 0205 (LEME), Case Postale 52, 61 rue Buffon, 75005 Paris, France.

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