

DESCRIPTION FOR THE GENERAL PUBLIC

Echinoderm calcium carbonate (calcite) skeleton is composed of many plates that are produced during a highly controlled intracellular biomineralization process. In many papers devoted to this group of invertebrates, it has been emphasized that the geochemical data obtained from their skeletons can provide insights into the chemical composition of ancient seas (in particular the molar Mg^{2+}/Ca^{2+} ratio). Unfortunately, there are no reliable experimental data dealing with Recent fauna that could confirm this hypothesis. Moreover, some recent data showed that the skeletons of echinoderms display high variation in geochemical composition, which may be related to physiological processes, and specific diet affecting chemical composition of their skeletons. Therefore, the main motivation behind this project will be to explain the causes of this variation. In particular, the project is planned to conduct experiments on living echinoderms in order to determine the effect Mg^{2+}/Ca^{2+} in seawater and Mg-enriched diet on the growth dynamics and chemical composition of echinoderm skeleton. In the planned experiments a few species of echinoderms will be used. Individuals will be kept in seawater with different molar Mg^{2+}/Ca^{2+} ratio, and will be fed with a diet containing different magnesium concentration. Different types of plates will be then subjected to catodoluminescence and geochemical analyses. This will allow a better understanding of the mechanisms that affect the chemical composition and growth dynamics of echinoderm skeleton, and to answer the question whether seawater is indeed the only source of ions in echinoderm biomineralization. New data may verify previous hypothesis which considers echinoderms as reliable proxy of chemical composition of ancient seas.