

A unique property of element composition of a coccolithophorid, *Emiliana huxleyi*

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Abstract

The cellular composition of elements in three microalgae such as *Emiliana huxleyi* (Coccolithophorales, Prymnesiophyceae), *Isochrysis galbana* (Isocrysidales, Prymnesiophyceae) and *Dunaliella tertiolecta* (Volvocales, Chlorophyceae) were determined by particle induced X-ray emission (PIXE) analysis. Both *E. huxleyi* and *I. galbana* belong to Prymnesiophyceae, *E. huxleyi* is unique to produce calcium carbonate crystals that are called coccoliths and *I. galbana* is known to be evolved to the direction of the disappearance of coccolith.

The value of a concentration factor, namely the ratio of the cellular content of respective element to that in culture medium, was remarkably high in Al, Mn, Fe, Se and P in the three species. The contents of Ca, Mn, Sr and Se were exceptionally higher in *E. huxleyi* than the other species. Ca and Sr, an analogue of Ca, were highly concentrated especially in *E. huxleyi* and are considered to be accumulated in the coccolith. The content of Mn and Se were also very high in *E. huxleyi* and respective intracellular concentrations were 1.14 mM and 20.3 μ M. The results suggest that the existence of mechanisms of Mn- and Se-concentrating and some essential metabolism in this alga.