

## PIXE-analysis of seaweeds for heavy metal accumulation

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### Abstract

It is known that heavy metals from anthropogenic sources are flowed into the coastal environment and are accumulated to relatively high levels in seaweeds. Seaweeds have a large biomass in coastal area and some of them are taken by humans. Thus, it is necessary to clarify mechanisms of heavy metals accumulation of seaweeds. In addition, heavy metal accumulation process of seaweeds has possibility to be applied to remediation process of coastal heavy metals contamination. In this study, we focused on a survey of heavy metals accumulation to seaweeds. Several species of seaweeds [algae:*Chlorophyta*, *Rhodophyta*, *Phaeophyta* and seagrass:*Monocotyledon*] and seawater were collected from five stations along the coastal area of Tokyo Bay. Then, samples were multi-element analyzed with PIXE and concentrations of 13 heavy metal elements (Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Y, Nb, Mo, Pb) in seaweeds and seawater were detected. Concentrations of seaweeds showed differences depending on variations of elements or seaweeds. Concentration factor (CF), which is the ratio of seaweed concentrations to seawater concentrations, showed the similar tendency with concentrations. Especially, *Monocotyledon* showed a tendency to incorporate higher CF values than *Chlorophyta*, *Rhodophyta* and *Phaeophyta*. So it was indicated that *Monocotyledon* could show a stronger function than algae in remediation of coastal heavy metal contamination.