

Recovery of Ocean Pollutants with Bio-concentration (Ecosystem)

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To date, we have been investigated that the biotransformation of various compounds with microorganisms such as yeast, thermophilic bacteria, fungi, and micro algae. Recently, we reported the functional modification of naturally occurring endocrine disruption related substances via enzymatic glucosylation. In this study, the recovery of ocean pollutants, mainly synthetic endocrine disruption related substances, using marine plankton was investigated as an improvement method of the ocean environment by the bioremediation.

The phytoplankton (*Chaetoceros gracilis*, *Chaetoceros* sp., *Nannochloropsis* sp., and *Pavlova lutheri*) was photoautotrophically cultivated in an artificial seawater for 2 weeks at 20°C with constant aeration by air with illumination by white fluorescent light. The substrate (dioctyl phthalate or bisphenol A) was added in the growing algal suspension and incubated at 20°C with gently shaking under white fluorescent light. The reaction mixtures were filtered on glass-filter to remove the algal cells. The used medium and the filtered algal cells were extracted. The remaining amounts of substrates in the used medium and the algal cells were determined by GLC analysis.

The amount of dioctyl phthalate in the medium (seawater) was decreased by the algal cells. While, bisphenol A (BPA) was accumulated in the cells of *Nannochloropsis* sp. (marine *Chlorella*).

The recovery of BPA from the seawater via a bio-concentration (using both zooplankton and phytoplankton) was also investigated. As a result, it was found that BPA added in the seawater was transferred and accumulated in the zooplankton cells (*Artemia* or *Brachinous*) and accumulated via marine *Chlorella* cells.