

Characterization and Long-Term Monitoring of a Coastal Environment by Assessment of the Macro-Algal Flora

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Macro-algae (seaweeds) are one of the primary elements of coastal biotas, and play an essential role in these ecosystems. In addition, the macro-algal flora is considered to be suitable for characterizing the condition of coastal environments and also assessing long-term changes in these sites, because macro-algae exhibit the following features: 1) they are basically benthic, and have little mobility even considering their distributional expansion by swarmers/spores; 2) they are moderately sensitive to water quality (e.g. nutrients, toxic substances) changes, because they absorb organic and inorganic matter from the tissue surface; 3) they are highly sensitive to changes in water transparency and the quantity of suspended particles/sediments; 4) they have relatively long lifetimes (several months to several years), and tolerate temporary environmental changes.

Our analyses of macro-algal floras (especially the species composition) of selected sites along the Osaka Bay area is based on regular seasonal sampling of macro-algae, a survey of specimens housed in several herbaria, and a review of published floristic lists. We found that the total number of species recorded at each site showed a clear relation to the physical and chemical conditions (i.e. transparency, water movement, sediments, etc.) and that species number was remarkably reduced in the inner region (NW part) of the bay; the species that dominated in eutrophic regions were also found in the entrance of bay; modifications of the coastal geography by reclamation are suggested to have caused the reduction of macro-algal biodiversity at this site.

By surveying herbarium collections of macro-algae housed in selected Herbaria, we are trying to determine the state of the macro-algal vegetation of the Osaka Bay region in the past, especially before the extensive reclamation activities of the last 40 years. This would provide information for discussing the goal of improving the coastal environment in the region.