

Evaluation of the influence of terrestrial organic matter on tideland surface layer by analysis of humic acid fraction in coastal sediment of northern tidelands of the Ariake Sea

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Most of the organic matter in the sediment is a macromolecular compound called humic substances. This is made of various substances of biological origin. It has different structure depending on the origin. Among them, humic acid fraction is often used for environmental assessment from the ease of extraction process[1].

Recently, in northern Ariake Sea, the observations of decrease of counterclockwise current were reported. Therefore, the changing in circulation of organic material may be occurred it the influence the surrounding environment at the surface area of the tideland. So, in this research, the environmental characteristics of the northern Ariake Sea in terms of circulation of organic matter by researching the structural characteristic of humic acid was investigated.

Tideland sediments were collected at four locations in the northern Ariake Sea. Humic acid fractions were extracted and isolated according to the IHSS soil humic acid extraction method. For chemical analysis, elemental analysis, UV-vis spectroscopy, stable isotope ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) analysis and phenolic hydroxyl group concentration measurement were conducted. These data have slight difference as each sample, differences between each sample were estimated by the statistical analysis.

Several characteristics of 2-D plot of each corresponding analytical value shows the correlation of each data such as atomic ratio H/C and $\delta^{13}\text{C}$ value. Principal component analysis picked up 5 data among the third principal component (up to the 90%). Cluster analysis of these five chemical analysis data shows the sample group was divided into mainly two clusters. Samples of HA (Hayatsue point, the eastern part, near Ariake river mouth) and TR(Tara point, the western part) were classified into different clusters. Further, each sample were classified reflecting the direction generally corresponding to the counterclockwise current. Clustering in the research seems to be classified from the viewpoint of the influence of terrestrial humic acid contained in marine humic acid, which seems to reflect the influence of organic matter transported from the Chikugo River. Thus, the influence of terrestrial organic matter can be transmitted by circulating counterclockwise circulation flow, affecting composition of organic matter and biological environment.

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