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Source and transportation of organic matter around the Korean peninsula: isotope investigation and land-ocean linkages

Hyun S.[1]

[1]Marine Geology and Geophysics Division, Korea Institute of Ocean Science and Technology (KIOST), 787 Hean-ro11, Ansan 426-744, Korea

A total 316 of surface and core sediments from the East Sea (ES), East China Sea (ECS) and coastal areas (CA) of Korean peninsula were compiled and interpreted in terms of the terrestrial and oceanic end-member and the linkage between land and ocean. The height value of $\delta^{13}C_{org}$ (-19.92‰) and the lowest value (-27.05‰) were present in surface sediment of Masan Bay and core sediment in East Sea, respectively. The values of $\delta^{15}N_{org}$ ranged from -1.30‰ in ECS core sediment to 9.80‰ in ES surface sediment, showing wide range of variability. Therefore, it is reasonable that the end-member of $\delta^{13}C_{org}$ around the Korean Peninsula might be in -19.5‰ as biogenic source organic matter end-member, and be in -27.5‰ as terrestrial organic matter end-member, respectively. However, it is hard to determine the $\delta^{15}N_{org}$ end-member since its variations are strongly associated with the sedimentary environment including diagenetic processes. Based on these end-members, the terrestrial portions of organic matter were determined. Relatively large fractions of terrestrial organic matter were observed in Korea Plateau sediment, East Sea. In particular, some ancient sediments from the core sediment exhibited lower $\delta^{13}C_{org}$, which suggests that large part of sediment came from neighboring places due to the horizontal sediment movement or resuspension. The sediment from the ECS core during glacial time, thus exposed sediments due to the lower sea level, and could be regarded as terrestrial sources, has a slightly higher value (the lowest values of -25.49‰) than those of ES. Therefore, this difference between terrestrial sources may come from sediment provenances. The sediment from the coastal area has a relatively higher $\delta^{13}C_{org}$ values indicating that large portion of organic matter was originated by the biogenic production. It is need to more detailed investigation through the analysis of typical terrestrial organic markers such as n-alkanes and its compound specific isotope study.