

Identification of Asian dust in hemipelagic sediments of East Asian marginal seas

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Detrital fraction contained in marine sediments can be generally used as climate proxies because variations in provenance and mineralogy could be affected by the precipitation distribution and weathering intensity. Element composition of marine sediment is essentially controlled by the mineral composition that is also affected by sorting effect during their transport process. The inland deserts such as Taklimakan and Gobi are large detrital sources for the East Asian marginal seas, and the detrital fraction in the sediments collected from the abyssal part of the Japan Sea / East Sea has been regarded as the mixture of eolian dust and the detritus derived from the Japan Arc. This feature can be used to reconstruct the variability of provenance and transport pathway of detrital fraction in the sediments. Relative contribution of dust from Taklimakan / Gobi could be strongly affected by dust availability in source area and wind system transporting the dust. Major changes in such detrital provenance are more easily reconstructed from the proximal soil record at loess plateau, where many provenance studies have been conducted. Loess can be classified into two types based on their element composition. One is typical loess distributed close to desert area. The other is peripheral soil (weathered loess) distributed surrounding typical loess and desert area. Weathered loess is distributed in the northeastern and southern China in modern times. Spatial distribution of these two types of soils have been also changed from time to time. In order to detect the change in provenances and interpret the terrestrial environment using detrital proxies in the marginal sea sediments, it is necessary to know the variability or range of the element and mineral composition of a particular provenance during the targeted time periods as well as the sorting biases during the transportation.

Keywords: hemipelagic sediment, aeolian dust, provenance, mineral composition, element composition, isotope composition