



Paleoenvironmental Change for the Southwestern Cheju Island Mud in the East China Sea since the Last Glacial Maximum

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The East China Seas (ECS) has received much attention over the past two decades, because it is one of the world's largest continental shelf seas and suffered dramatic changes in the sedimentary provenance since the last glacial maximum (LGM). The Southwestern Cheju Island Mud (SWCIM), located in the northern margin of the East China Sea, has shallow sheet and round shape covering lower surface developed by erosion. SWCIM is known to be supplied with large amounts of sediments from Huanghe, Changjiang and various rivers in Korea even in the Taiwanese rivers. Many studies have been conducted to identify the effects of rivers and deposition process of SWCIM, but no consensus has been reached. In this study, we tried to clarify the provenance change of fine-grained sediments with the sea level changes since LGM by the clay mineral and rare-earth elements (REEs) analyses using 4 cores (99MAP-P63, 07YS-PC12, E03-06, E03-11) recovered from SWCIM. REEs analysis indicates that SWCIM sediments are very similar to Chinese rivers sediments. Based on the combination of clay mineral composition, grain size, and age dating, SWCIM sediments can be divided into 3 units. Unit 3 (>15 ka BP) sediments are composed of illite 65.8 %, chlorite + kaolinite 28.1 %, smectite 6.1% with high silt fraction. Unit 2 (15~6 ka BP) are composed of illite 64.9 %, chlorite + kaolinite 31.3 %, smectite 3.8% with increasing coarse-grained fraction. Unit 1 (<6 ka BP) are composed of illite 65.4 %, chlorite + kaolinite 30.6 %, smectite 4.0 % with very high clay fraction. Their contributions varied greatly in space and time since LGM. Unit 1 sediments were deposited during the low stand stage and mainly derived from Paleo-Huanghe because they have high smectite content. Unit 2 sediments were deposited with the abrupt sea level rise and supplied from Paleo-Huanghe and Paleo-Changjiang with little contribution from Korean rivers owing to high chlorite + kaolinite. Unit 3 sediments were deposited with the present sea level and mainly derived from Changjiang through the Yellow Sea Coast Current, Changjiang Diluted Water, and Kuroshio Current due to high illite. As the sea level rise with the time since LGM, the contribution from the Huanghe decreased, whereas from Changjiang increased.