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Paleoenvironmental changes in the Sea of Okhotsk over the past 60 kyrs

Osamu Seki^{1*}, Naomi Harada², Miyako Sato², Kimitaka Kawamura¹, Akira Ijiri², Takeshi Nakatsuka³

¹Hokkaido University, ²JAMSTEC, ³Nagoya University

We measured terrestrial plant biomarker (long-chain n-alkanes) in the sediment cores taken from the Sea of Okhotsk to examine paleoclimatic utility of long-chain n-alkanes in marine sediments. This study demonstrates that sedimentary record of n-alkane in the sea has a high potential to provide important complementary paleo-climate/paleo-environmental information. Molecular distributions of long-chain n-alkanes in marine sediments show a typical signature of terrestrial plant wax derived n-alkanes with strong odd carbon number predominance from the last glacial to the present, suggesting a source of long-chain n-alkanes in the Okhotsk Sea sediments has been terrestrial higher plants throughout the time. The down core profiles of concentrations of C₂₅-C₃₅ n-alkanes in XP07-C9 collected from the northwestern site revealed three events of enhanced terrestrial organic matter input during the last deglaciation. The two pronounced events correspond to Melt Water Pulse (MWP) events 1A (14.5-12.5 ka) and 1B (11-6.5 ka). These events possibly linked to increases in river discharge and erosion of submerged continental shelf due to drastic rise in sea level. Down core profiles of molecular distributions of n-alkanes in the Okhotsk Sea sediments significantly vary over the last 25 kyrs, and are similar to that of a peat core sequence in the East Russia and essentially consistent with pollen data from marine and peat core sequences.

Keywords: Sea of Okhotsk, sediment, paleoenvironment, biomarker