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Paleoproductivity vs. influx of terrestrial biomarker in sediment from the Korean Plateau, East Sea (Japan Sea) since the MIS 11

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A piston core collected from the Korean Plateau, East Sea (Japan Sea) of Korea was conducted in terms of variations in paleoproductivity and influx of terrestrial biomarker. The distribution of terrestrial n-alkanes signatures is characterized by the occurrence of high odd number frequency with a minor contribution of specific compound (nC27 only). Average Chain Length (ACL) and Carbon Preferences Index (CPI), both of which are derived from n-alkane combination, show similar shifting between glacial and interglacial periods. Previous studies of SST variation have shown that glacial-interglacial scale changes were quite variable with the maximum range of 26oC in MIS 7, and the minimum range of 12oC during MIS 2 and 6. Therefore, paleovegetation communities had been changed in responding to paleoclimatological variations, and the input amount of terrestrial compound was strongly linked with paleoclimatologic changes. The isotopic composition of δ13C and δ15N of organic matter, which showed extreme temporal variation since MIS 11, indicates the influx of large amount of terrestrial organic matter from the neighboring terrestrial environments during MIS 2, 8 and 10. In particular, depleted values of δ13Corg during MIS 2, 8 and 10 were coincident with lower nitrogen isotope values indicating local paleoceanographic effects such as paleoproductivity changes. Decoupling between δ13Corg and δ15Norg during MIS 1, 3, 5, 7 and coupling of the two during MIS 8 and 11 can be observed, which appear to be interpreted as local productivity changes. In particular, high abundance of cholesterol and C21 n-alkanes, which were derived from diatom, increased during interglacial periods. Therefore, alkenones, SST and n-alkanes signatures coincide with δ13Corg and δ15Norg variations during glacial-interglacial cycles and further strongly associated with cholesterol abundance suggesting that the paleoenvironmental conditions in East Sea during glacial-interglacial periods were sensitive not only to global climate changes but also to local paleceanographic variations.