

Variations in terrestrial plant biomarker compositions in a sediment core of IODP Site U1423 over the last 4 Ma: Paleovegetation and transport of terrigenous matter

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For reconstructing paleovegetation, spore/pollen and plant mega-/mesofossils are commonly used, and recently, plant biomarkers are also applied. The objectives of our study are to reconstruct long time-scale variations in paleovegetation in the East Asia and transport of terrigenous material to the East Asian marginal sea, and to evaluate long time-scale biogeochemical cycles in the marginal sea during the Pliocene to Pleistocene (over the 4 million years). In the present report, we focus terrigenous biomarkers such as plant wax-derived *n*-alkanes as well as terrestrial plant terpenoids, in which structures vary depending on taxonomic differences. Moreover, we compare between the data for plant biomarkers and spore/pollen in the same horizons.

Sediment core was collected from the eastern part of the Japan Basin at 41°41.95'N, 139°4.98'E by Integrated Ocean Drilling Program (IODP) Expedition 346. Lipids were extracted with dichloromethane / methanol, and separated to aliphatic, aromatic and polar fractions. Lipids were identified and quantified by GC/MS.

Concentrations of long chain *n*-alkanes increase from about 1.7 Ma. This result implies that plant waxes were more efficiently transported by eolian dust due to global cooling during the early Pleistocene. Triterpenoids such as α -amyron, β -amyron and friedelin, and diterpenoids such as sugiol and dehydroabietic acid were mainly identified in all samples. The plant terpenoid concentrations were found to increase since about 1.3 Ma. Gymnosperm / angiosperm ratios estimated by diterpenoid / (diterpenoid + triterpenoid) ratios increase during 3.0 - 1.5 Ma, which is concordant with results of conifer / broad-leaf wood ratios based on pollen compositions. Thus, gymnosperm-dominant paleovegetation in land areas around the site U1423 might be distributed during the Pliocene to early Pleistocene.