



Impact of flood events on the BIT index: A case study of the Têt River (SW France)

J.-H. Kim (1), W. Ludwig (2), S. Schouten (1), P. Kerhervé (2), L. Hertfort (3), J. Bonnin (2), J.S. Sinninghe Damsté (1)

(1) Royal Netherlands Institute for Sea Research (NIOZ), Department of Marine Biogeochemistry and Toxicology, PO Box 59, 1790 AB Den Burg, Texel, The Netherlands, (2) CEFREM-CNRS UMR 5110, Université de Perpignan, 52 avenue Paul Alduy, 66860 Perpignan Cedex, France, (3) Oregon health and science university, Department of Environmental and Biomolecular Systems, 20000 NW Walker Rd, Beaverton, OR 97006, USA (jhkim@nioz.nl / Telephone: (+31) (0)222-369410 / Fax: (+31) (0)222-319674)

The BIT (Branched and Isoprenoid Tetraether) index, a tracer for terrestrial organic matter (OM) input, is based on the relative abundance of non-isoprenoidal glycerol dialkyl glycerol tetraethers (GDGTs) derived from organisms living in terrestrial environments versus a structurally related isoprenoid GDGT “crenarchaeol” mainly produced by marine Crenarchaeota. We studied suspended particulate matter (SPM) in waters of the Têt River (SW France) to reconstruct variations in the BIT index. This river system is characterized by the occurrence of flood events, which brings substantial amounts of terrestrial OM to the NW Mediterranean. The mean $\delta^{13}C_{POC}$ and the C/N ratio of SPM were -26.2‰ , and 6.1, indicating that OM in river water SPM primarily originated from C_3 plant-derived soil OM. The average BIT value of river water SPM (0.8) was substantially higher than that of the offshore seawater SPM (<0.01). Such high BIT values of riverine SPM in combination with $\delta^{13}C_{POC}$ and C/N ratio values confirm that the increased BIT indices previously observed in the Têt prodelta surface sediment time series (Kim et al., *Geochemistry Geophysics Geosystems* 7, Q11017, doi:10.1029/2006GC001306, 2006) were indeed due to high inputs of soil-derived OM from land transported via rivers to the sea. Our results further suggest that the BIT index is an appropriate proxy for terrestrial OM input into coastal oceans such as the Gulf of Lions in the NW Mediterranean where the mountains are adjacent to the shore and where flood events play an important role in delivering terrestrial OM to the sea.