



Tracing tetraether lipids from source to sink in the Rhône River system (NW Mediterranean)

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We investigated soils and river suspended particulate matter (SPM) collected in Rhône and its tributary basins as well as marine surface sediments collected in the Rhône prodelta (Gulf of Lions, NW Mediterranean). We traced the signal of branched glycerol dialkyl glycerol tetraethers (brGDGTs) from source to sink via rivers and identified the sources of brGDGTs in rivers and marine sediments. Core lipid (CL) fractions were investigated for soils as well as marine surface sediments. However, the concentration and distribution of brGDGTs of both CL and intact polar lipid (IPL) fractions were investigated for river SPM in order to distinguish more recently produced (IPL-derived) GDGTs from older (CL) GDGTs, since IPLs are less stable than CLs. Our results showed that soil pH explains most of the variance in the brGDGT distribution rather than mean annual air temperature (MAAT) in our soil dataset. The observed changes in the distribution of CL brGDGTs in the river SPM suggest that the provenance of CL brGDGTs brought by the river to the sea might be more restricted to certain areas in the lower Rhône River and its tributary basins. In the marine surface sediments, it appears that the input of riverine brGDGTs is the primary source of brGDGTs in the Rhône prodelta but the brGDGT composition may be slightly modified by in-situ production of brGDGTs in this system.