

SOURCES AND FATE OF BACTERIOHOPANEPOLYOLS IN THE WATER COLUMN AND THE SEDIMENTS OF THE BLACK SEA

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Various bacterial groups contribute to the hopanoid inventory of marine sediments. These microorganisms are often adapted to specific chemo-physical milieus and can thus be excellently studied in the Black Sea with its oxic upper water mass being constantly separated from the anoxic methane-rich water body below. By using a highly sensitive LC-MS method we studied the distribution and relative concentration of bacteriohopanepolyols (BHP) in the suspended matter sampled at different water depths. In the photic zone we found high concentrations of a 2-methyl BHP pointing to a cyanobacterial source (Summons *et al.*, 1999). Below the light-penetrated zone, in the transition between oxic and anoxic waters (~120m water depth), concentrations of BHPs specific for methanotrophic bacteria clearly increase (Blumenberg *et al.*, 2007). These BHPs include mainly hopanoids with amino functionalities and a 3-methyl BHP. Moreover, the co-occurrence of aminopentol (17 β (H),21 β (H)-35-aminobacteriohopane-30,31,32,33,34-pentol) with aminotetrol (17 β (H),21 β (H)-35-aminobacteriohopane-31,32,33,34-tetrol) argues for methanotrophic bacteria of the type I and/or the type X cluster as origin (Talbot *et al.*, 2001). In the respective depth interval anaerobic ammonium oxidising planctomycetes most likely also contribute to the BHPs in the particulate organic matter. These bacteria were shown to be present at the respective zone of the Black Sea water column and to contain high amounts of hopanoids (Kuypers *et al.*, 2003; Sinnighe Damsté *et al.*, 2004). Notwithstanding that hopanoid production in the transition zone is relatively high, the hopanoid distribution in the sediments is clearly predominated by an input from photic microorganisms. For instance, ring-A methylated non-extended hopanoid hydrocarbons, which are diagenetic products of BHPs present in both, cyanobacteria and methanotrophs, were found in high amounts in the sediments, but the respective $\delta^{13}\text{C}$ -values clearly argue against methanotrophic bacteria as sources. The sedimentary hopanoid inventory seems to be less influenced by microorganisms living in the transition zone which is most likely related to a lack of a mechanism transporting the particles to the sea floor (e.g. zooplanktonic fecal pellets).

Here we present data on the distribution and concentration of BHPs and non-extended hopanoids that shed new light on the sources and fate of bacterial triterpenoids in the Black Sea water column and the sediment.

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