

Biosynthesis and geochemical fate of bacterial hopanoids in anoxic environments

Bacteriogenic hopanoids (bacteriohopanepolyols; BHPs) are widely distributed highmolecular weight components, found in about 50% of bacterial isolates analysed so far, and account for the ubiquity of their diagenetical products, the geohopanoids. Hopanoids with a likely bacterial origin have a geological record of 2.77 billion years. Until recently it was thought that the biosynthesis of hopanoids is restricted to aerobic bacteria and therefore occurrences in recent and fossil samples are used as indication for an oxygenated milieu. However, few recent studies showed that anaerobic bacteria are indeed capable of producing hopanoids. Nevertheless, the importance of these and yet unknown anaerobic bacteria in the geological hopanoid-record and also the geochemical fate of hopanoids in anoxic settings are still unclear. Major objectives of this proposal are to ζ determine the capability of still non-investigated anaerobic bacteria of synthesising hopanoids, ζ identify hopanoid producing bacteria in anaerobically formed, methane fuelled microbial Black Sea mats, and to ζ characterise the fate and structural modifications of allochthonous and autochthonous bacteriohopanepolyols (BHPs) during early diagenesis in anoxic sediments (i.e. the Black Sea).