

CHANGES IN STABLE CARBON ISOTOPES OF METHANE ALONG A SALINITY GRADIENT IN A HYPERSALINE MICROBIAL MAT SYSTEM

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ABSTRACT

The purpose of this study was to examine how the stable carbon isotopes of methane and possible methanogenic substrates change in microbial mat communities as a function of salinity. Microbial mats were sampled from four different field sites located within the salterns of the Exportadora de Sal de C. V., Baja California Sur, Mexico. Samples were analyzed for the stable carbon isotopes of the particulate organic matter (POM), dissolved inorganic carbon (DIC), and dissolved methane within the mat. POM $\delta^{13}\text{C}$ values (-6.7 to -13.5 permil) and DIC $\delta^{13}\text{C}$ values (-1.4 to -9.6 permil) were similar to previously reported values. However, there are no prior reports of methane $\delta^{13}\text{C}$ values within the mats, and we found considerable variability among sites. Values range from -49.6 to -74.1 permil, and are most likely controlled by differences in the dominant metabolic pathways due to salinity differences.