



Degradation of organic phosphorus compounds in anoxic Baltic Sea sediments: A ^{31}P nuclear magnetic resonance study

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ABSTRACT: The composition and abundance of phosphorus extracted by NaOH-ethylenediaminetetraacetic acid from anoxic Northwest Baltic Sea sediment was characterized and quantified using solution ^{31}P nuclear magnetic resonance. Extracts from sediment depths down to 55 cm, representing 85 yr of deposition, contained 18.5 g m^{-2} orthophosphate. Orthophosphate monoesters, teichoic acid P, microbial P lipids, DNA P, and pyrophosphate corresponded to $6.7, 0.3, 1.1, 3.0,$ and 0.03 g P m^{-2} , respectively. The degradability of these compound groups was estimated by their decline in concentration with sediment depth. Pyrophosphate had the shortest half-life (3 yr), followed by microbial P lipids with a half-life of 5 yr, DNA P (8 yr), and orthophosphate monoesters (16 yr). No decline in concentration with sediment depth was observed for orthophosphate or teichoic acid P.

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