

Abstract

Dust and biomass burning aerosols are a significant source of phosphorus (P) to surface oceans. Deposition of P can enhance primary production and result in carbon sequestration. Studies have explored the solubility of P delivered by aerosols, but this is the first to directly quantify enhanced microbial P uptake rates and assess biologically available P (BAP) due to deposition events. Total microbial P uptake rates were assessed with natural seawater incubations using aerosol filters that collected African dust and African biomass burning from fires. Radiolabeled ^{32}P phosphate was used to trace the uptake of P into the microbial community as well as P incorporation into the microbial adenylate system. Compared to our control, both the dust and biomass burning spikes elicited a significant enhancement of P uptake rates. Our results indicate that deposition events do deliver BAP, and aerosol source impacts the concentration of BAP.