



^{15}N -labeling combined with analysis of ^{15}N in hydrolysable amino acids to investigate nitrogen incorporation and retention in bacteria and algae in a subtropical, intertidal sediment

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The combination of stable isotope labeling and stable isotope analysis of hydrolysable amino acids (HAAs) including the bacterial biomarker D-alanine (D-Ala), is a new method for biogeochemical studies (Veuger et al. 2005). In the present study, we applied this method in a ^{15}N -labeling experiment in the subtropical Brunswick estuary (New South Wales, Australia) to clarify nitrogen incorporation and retention by the microbial community in an intertidal sediment. $^{15}\text{NH}_4^+$ was injected into the sediment and ^{15}N was traced into bulk sediment, total proteinaceous biomass (total HAAs), bacteria (D-Ala) and fauna. This unique approach allowed us to trace incorporation of ^{15}N into bacteria, algae and fauna (the three major groups involved in benthic N cycling) and to investigate the subsequent fate of the incorporated ^{15}N during a 30-day period in situ. Results showed very strong retention of ^{15}N in the sediment due to very efficient recycling of ^{15}N by the microbial community with a major contribution by bacteria.