

P003 A stable isotopic approach to elucidating organic nitrogen cycling

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Nitrogen availability is the limiting factor for growth and biomass production in almost all environments, but whilst considerable advances have been made in the understanding of the amounts and movements of inorganic forms of nitrogen in the cycle, our knowledge of the pathways and transformations of the organic forms of nitrogen is very limited. However, it is starting to become apparent that this organic nitrogen may play a far more important role than previously thought. In order to investigate the mechanisms and rates of decomposition of organic nitrogen-containing compounds in soils, ¹⁵N-labelled rye grass was added to plots of soil which were sampled at intervals up to 365 days. The soil samples were hydrolysed and the amino acids and amino sugars extracted and analysed by GC/MS. The mass spectra of these compounds exhibited an increased abundance of [A+1]⁺ ions as a result of the ¹⁵N labelling, which enabled the relative enrichments of individual compounds to be calculated. These results show the rates at which the ¹⁵N label is incorporated into the individual compounds and then subsequently removed over time.