

## Amino acid composition of natural bacterial assemblages and particulate organic matter in the western North Pacific

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Amino acid compositions were determined for natural marine bacterial assemblages (bacterium-size particles separated from other organisms and particles) and suspended particulate organic matter (POM) collected at subarctic and subtropical stations in the western North Pacific. We found that L-proline (L-Pro) content was remarkably high [38 - 57% of total hydrolysable amino acids (THAA)] in natural marine bacterial assemblages. These values were much higher than the corresponding values reported in the literature or those determined by ourselves for isolated bacterial strains (typical range, 4.3 - 8.8%). In POM, L-Pro content was low (<5% of THAA) in the upper layer (0 - 200 m), whereas it was high (24 - 26% of THAA) at the depth of 1000 m. Determination of enantiomeric amino acids in POM revealed that the ratio of D-/L- amino acids at the depth of 1000 m (0.054 - 0.061) was higher than that in the upper layer (0.012 - 0.039). These results confirm and add to the previous proposition that amino acid composition is systematically altered during bacterial reworking of marine organic matter, indicating that, in addition to the conventional indicator using enantiomeric amino acid ratio, L-Pro content can be a new indicator of the enrichment of POM by the organic matter derived from bacteria. Our results also underscore the importance of identifying bacterial constituents rich in L-Pro, which might play an important role in biochemical processes mediated by uncultured natural marine bacteria.

Keywords: marine bacteria, amino acids, proline, enantiomers, particulate organic matter