

Use of electrospray ionization mass spectrometry for profiling of crude oil effects on the phospholipid molecular species of two marine bacteria

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Abstract

We investigated the membrane lipid composition of two hydrocarbon-degrading gram-negative bacterial strains (*Pseudomonas nautica* IP 617 and *Marinobacter hydrocarbonoclasticus*) initially cultured on a soluble substrate, then on petroleum hydrocarbons, and finally taken back onto the soluble substrate. For the two strains, the growth on petroleum and the return to the initial medium showed major, but comparable, qualitative and quantitative modifications of the intact phospholipid molecular species (IPMS) composition. Furthermore, since bacterial membranes are mainly made up of phospholipids, these modifications reflected hydrocarbon assimilation, restoration abilities and membrane fluidity adaptation. The electrospray ionization mass spectrometry (ESI-MS) analysis of intact phospholipid provided some new information (e.g. *sn* fatty acyl chain distribution) that could not be assessed by the classical fatty acid analysis. Moreover, such information should be particularly helpful with regards to bacterial taxonomy and xenobiotic toxicity studies. Copyright © 2005 John Wiley & Sons, Ltd.

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