



Conference Abstract

Environmental genomics for benthic monitoring of North Sea oil and gas offshore platforms

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Abstract

During the last decade, considerable efforts have been undertaken to achieve a “good ecological status” of European coastal waters and ensuring the development of methodological standards for the evaluation of this status. However, the current routine biomonitoring implicates time-consuming and costly manual sorting and morphological identification of benthic macrofauna. In our study, we tested the performance of environmental DNA metabarcoding targeting microbial communities and meiofauna as an alternative to traditional macrofauna-based monitoring. We focused on environmental impact assessment of offshore oil and gas industry. We used three genetic markers (18S V1V2, 18S V9 and COI) to assess the environmental pressures induced by the platforms. All markers showed patterns of alpha and beta diversity consistent with morphology-based macrofauna analyses, significantly changing along distance gradients from the platforms. The impact of the operational discharges was also detected by the variation of biotic indices values, AMBI index showing the best correlation between morphological and eDNA datasets. Finally, the sediment physicochemical parameters were used to build a local *de novo* pressure index that served as benchmark to test the potential of a taxonomy-free approach. Our study demonstrates that metabarcoding approach outperforms morphology-

based approach and can be used as a cost and time-saving alternative solution to the traditional morphology-based monitoring in order to monitor more efficiently the impact of industrial activities on marine biodiversity.

Keywords

metabarcoding, environmental impact assessment, benthic monitoring, sediment DNA, marine industry

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