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# Assessing microplastics in *Nephrops norvegicus* and its surrounding sedimentary environment in the Northeast Atlantic

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## Abstract

Microplastics (MPs) are a major global concern due to their ubiquity and heterogeneity in the marine environment. The presence of MPs has attracted increasing research attention in commercially important seafood species such as the Dublin Bay Prawn, *Nephrops norvegicus* due to the occurrence of these emerging contaminants in the marine environment and their potential to enter the human food chain.

This research investigated the abundance of MPs in both *N. norvegicus* and associated benthic sediments across the six primary fishing grounds in the North-East Atlantic. It assessed the relationship between MP abundances in *N. norvegicus*, its biological parameters, and their surrounding sedimentary environment.

The MP colour, size, shape, and polymer type recorded in *N. norvegicus* mirrored those found in the surrounding environmental samples. The level of MP concentrations in *N. norvegicus* ( $n = 600$ ) could potentially be related to local sources, with relatively low abundances recorded in this study,  $2.20 \pm 2.47$  items per individual, compared to other regions in Europe. Furthermore, larger organisms contained a lower abundance of MPs, demonstrating the unlikely bioaccumulation of MPs in *N. norvegicus*.

Given the complexity of MPs present in the marine environment, the authors recommend a more holistic monitoring approach, with the integration of *N. norvegicus* and sediments along with other species and matrices to cover all ecosystem compartments to provide a comprehensive database of MP levels and trends in the marine environment. Based on the results of this study, data on MP ingestion could be used to assess trends in the amount and composition of litter ingested by marine animals towards fulfilling requirements of descriptor 10 of the Marine Strategy Framework Directive.

**Keywords:** Dublin Bay prawn, North, east Atlantic, plastic pollution, benthic sediments, Marine Strategy Framework Directive

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