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Microplastics in the Baltic Sea water: fibers everywhere.

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Presence of thin synthetic fibres (microfibres, tens of micrometres in diameter) in the surface waters and sediments is documented in different studies; however, the data on their exact abundances in the marine environment are commonly not presented owing to the shortcomings of the sampling procedure and general absence of well-established methodology for microplastics data collection. Nevertheless, we made an attempt to qualitatively analyse the amounts of microplastic fibres in the water column of the Baltic Sea. Water samples acquired during 6 cruises over the Baltic Sea Proper in 2015-2016 were filtered using 174 μm filters, which were subsequently analysed by microscope. From the total of 95 examined filters, 63% contained fibres. They were identified by colour and the reaction to the mechanical action of a thin needle: justification of anthropogenic origin was considered to be enough; any questionable objects were discarded. Fibres comprise more than 90% of the whole microplastic particles found in the near-bottom layers in the coastal zone and around 24% of microplastics in the surface and intermediate waters, with mean concentrations of 0.71 and 0.07 fibres per litre, respectively. Although the methodology still requires a lot of enhancement, even the preliminary results indicate ubiquitous distribution of the microfibres in the water column of the Baltic Sea with surface and bottom layers revealing higher abundances of microfibres in comparison with intermediate layers, and open-sea waters being less contaminated than the coastal ones. Apart from enhancing the sampling technics, we consider that it is crucial to understand principal physical features of fibers behavior in the marine environment (e.g., settling, entrainment by currents), as it would provide an opportunity to parameterize their transport and further on to model distribution of fibers in the water column.
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