

H43O-2277 - Assessment of Synthetic Microfibers from Clothing in the Aquatic Environment and Implications for Zooplankton

Abstract

Microplastics encompass all plastics that are less than 5mm. They are in the form of microbeads, micro fragments, and microfibers which are now found in all aquatic and terrestrial environments. Microfibers generally originate from fabrics and are shed from clothing during the laundering process. Approximately two thirds of all textile items are now synthetic, with polyester being the most common synthetic fiber. It is estimated that 0.33 million tons of textile microfibers enter the oceans annually from domestic and commercial laundries, where they can be consumed by lower trophic level marine organisms. The major goal of our study was to assess the shedding of microfibers during the washing and drying process from fabrics most commonly used in the clothing industry. Thirty two fabric types examined, included hemp, polyethylene, nylon, Tencel®, viscose, recycled polyester, polyester, and polyamide. Our results indicated that polyamide fabrics shed the largest amount of fibers. In natural water samples, obtained along the axis of the Connecticut River which passes through a highly urbanized area, microfibers accounted for 29% of the total microplastics present in surface waters, whereas in Long Island Sound where the Connecticut River empties out, microfibers accounted for 7% of the total microplastics. Microfibers were also detected in the most dominant zooplankton species, i.e. *Calanus* sp. encountered during our field study accounting for approximately 11% of the total microplastics ingested, suggesting active uptake of microfibers by these animals.

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