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Development of Monitoring and Removal Strategies of Emerging Micropollutants in wastewaters

NEWSLETTER

July '23



Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης





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Sorption Behavior of Antibiotics on Virgin and Aged PLA and PET Microplastics in Aqueous Matrices

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Participation in conferences



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Publications

Review

Fate and Removal of Microplastics from Industrial Wastewaters

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Abstract: Industrial sites are typically located in close proximity to bodies of wastewater a prevalent source of pollution. Microplastics, which are plastic fragments of everyday activities or industrial operations and are smaller than 5 mm in size, end up in wastewater treatment plants (WWTPs). The objective of this research is to investigate the fate of microplastics in industrial WWTPs worldwide, the effectiveness of diverse advanced treatment technologies in eliminating microplastics and their negative impact on aquatic environments has been years. The progressive discharge of plastic waste, insufficient detection and removal methods and a sluggish disposal rate have led to the continuous presence of microplastics in various ecosystems worldwide, such as domestic wastewater and industrial effluents. Recent studies have revealed that they can adsorb a variety of pathogens, heavy metals, and other toxic substances that are commonly used in production processes. Microplastics in aquatic life, which might lead them up the food chain to human bodies, result in gut blockage, digestion disturbance and diminished reproductive growth. Microplastics in the environment have become a growing threat and cause for concern, demanding the containment and removal of microplastics. This analysis offers a comprehensive view of current and developing techniques for microplastic removal from industrial wastewater, which are the most challenging in systems containing microplastics. A review of the effect of microplastics on human health is also conducted. This analysis offers a comprehensive view of detection and removal strategies and their related concerns in order to establish standard that minimizes the potential hazardous effects of microplastics in the environment.

Keywords: microplastics; industrial wastewater; fate; size; shape; color; removal



Citation: Gkika, D.A.; Tolkou, A.K.; Evgenidou, E.; Bikiaris, D.N.; Lambropoulou, D.A.; Mitropoulos, A.C.; Kalavrouziotis, I.K.; Kyzas, G.Z. Fate and Removal of Microplastics from Industrial Wastewaters. *Sustainability* **2023**, *15*, 6969. <https://doi.org/10.3390/su15086969>



Review

Do poly(lactic acid) microplastics instigate a threat? A perception for their dynamic towards environmental pollution and toxicity

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HIGHLIGHTS

- The growing production of polylactic acid generates queries about MPs formation.
- (Bio)degradation of PLA has a slow pace and selective character in the environment.
- Absorption capacities and toxicity data about PLA MPs are included.
- Source data about the impact of PLA MPs on the natural ecosystems.
- Current research status and knowledge gaps in the frame of PLA MPs are highlighted.

ARTICLE INFO

Editor: Daniela Baroni

Keywords: Microplastics; Biodegradation; Polylactic acid; Toxicity; Bioremediation

GRAPHICAL ABSTRACT



ABSTRACT

Fears concerning microplastic (MP) environmental fate and persistence are progressively expanding on a global basis, with the emphasis given to manufacturing bioplastics for substituting petro-derived plastics extensively growing. Among them, poly(lactic acid) (PLA) holds a pioneering role towards the replacement of conventional polymeric materials, owing to its multifunctional properties, including superior mechanical properties, low cost, renewability, great biocompatibility, transparency, and biodegradability (including many fields of application). Due to the wide applicability of PLA in several sectors of everyday life, its waste is to be released into the environment is expected to follow a growing tendency during the upcoming years. Even though PLA is a biodegradable polymer, it actually degrades under specific competing environments, including a rich oxygen environment with high temperatures (50–90 °C, high humidity (>60% moisture)) as well as the presence of micro-organisms (thermophilic bacteria). Additionally, in various



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