



“Gheorghe Asachi” Technical University of Iasi, Romania



## EVALUATING ECOLOGICAL IMPACTS AND ATMOSPHERIC FATE OF MICROPLASTICS: ECOLOGICAL PERSPECTIVES AND CHALLENGES

Enes Özgenç<sup>1\*</sup>, Emine Keleş<sup>2</sup>, Erdi Buluş<sup>3,4</sup>, Gülseren Sakarya Buluş<sup>5</sup>, Günay Yıldız Töre<sup>6</sup>

<sup>1</sup>Health Services Vocational College Environmental Health Program, Trakya University, Edirne, 22030, Turkey

<sup>2</sup>Department of Landscape Architecture, Faculty of Architecture, Trakya University, Edirne, 22030, Turkey

<sup>3</sup>Istanbul Arel University, ArelPOTKAM (Polymer Technologies and Composite Application and Research Center), Istanbul, 34537, Turkey

<sup>4</sup>Istanbul Arel University, Vocational School, Department of Transportation Services, Civil Aviation Cabin Services Program, Istanbul, 34295, Turkey

<sup>5</sup>Istanbul Provincial Health Directorate, R&D Projects Unit, Istanbul, 34093

<sup>6</sup>Department of Environmental Engineering, Çorlu Faculty of Engineering, Tekirdağ Namık Kemal University, Tekirdağ, Turkey

### Abstract

Plastic pollution has emerged as a critical global issue, with the impacts of microplastics (MPs) on ecosystems becoming increasingly significant. These microscopic plastic particles pose severe threats to ecological systems and their atmospheric fate. The formation of MPs is a complex process influenced by a variety of sources. Their distribution is significantly affected by atmospheric dynamics, including wind and weather events, leading to their deposition on the Earth's surface through rain, snow, and dust. Consequently, MPs infiltrate both aquatic and terrestrial ecosystems, accumulating in water bodies, soil, and plant life, thereby posing potential risks to human health via trophic transfer. Understanding the fate of MPs in the atmosphere is crucial, yet information on this topic remains limited. This study aims to address this gap by investigating the ecological impacts of MPs and their atmospheric behavior. Additionally, it highlights the analysis methods used to detect the adverse effects of MP pollution on the environment and ecosystems. The study also discusses the misinformation arising from various analytical techniques, the environmental threats posed by both MP and non-MP substances due to misinformation, and the challenges in maintaining quality control during analysis.

By addressing these current limitations, this study provides a foundation for future research and policy development, emphasizing the need for accurate analysis methods and comprehensive understanding of MP pollution. This work not only underscores the urgent need to mitigate MP pollution but also sets the stage for developing effective strategies to address this pervasive environmental challenge.

*Key words:* ecological, environmental, health, microplastic, plastic pollution

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\* Author to whom all correspondence should be addressed: e-mail: enesozgenc@trakya.edu.tr