Plastic pollution in a stream that runs through a medium-sized city in Argentina

Sebastián Tognana^{*1}, Susana Montecinos^{*†2}, Milagros Ascazuri^{*3}, Agustina Grigera^{*3}, Romina Ponce^{*3}, Marcelo Gil^{*3}, Walter Salgueiro¹, and Carlos Frosinini¹

¹IFIMAT-CIFICEN, CICPBA – Pinto 399, Tandil, Provincia de Buenos Aires, Argentina ²IFIMAT-CIFICEN, CONICET – Pinto 399, Tandil, Provincia de Buenos Aires, Argentina ³Facultad de Ciencias Exactas-UNCPBA – Pinto 399, Tandil, Provincia de Buenos Aires, Argentina

Abstract

Plastic waste in freshwater bodies comes, in many cases, from waste generated in cities and discharged through effluents from treatment plants, storm water discharges or directly dumped into the water body. This work presents results about Langueyú, which is a low-flow stream that receives the discharge from Tandil, a medium-sized city located in the Pampas region of Argentina. In previous studies, it was found that there is a highly polluted area of this stream, which is located after the discharge of two wastewater treatment plants. This work is an exhaustive study that includes the quantification of the micro, meso and macroplastics present in this highly polluted point, and analyzes their possible sources. Samples of water and sediment were extracted from the stream and analyzed. A concentration in the order of a million microplastics per cubic meter was found in the water, and in the order of a million microplastics per square meter were found in the sediment. A large amount of meso and macroplastics were found in the stream banks. The methodology for the extraction and analysis of the samples was discussed and adapted for each type of sample (water and sediment), the different sizes of plastic waste present (micro, meso and macroplastics), and the characteristics of the stream. The transport of microplastics at a distance of 3 kilometers from the mentioned point was analyzed, and the influence of the discharges from the wastewater treatment plants on the stream was discussed.

Keywords: Microplastics, wastewater treatment plant, mesoplastics, macroplastics, stream

*Speaker

 $^{\ ^{\}dagger} Corresponding \ author: \ dmonteci@ifimat.exa.unicen.edu.ar$