

ABSTRACT OF THESIS

Thesis Title: TESTING MICROPLASTIC REMOVAL EFFICIENCY OF DIFFERENT FILTER MEDIA

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Microplastics are tiny plastic particles that are less than five millimeters (0.2 inches) in diameter. They can be categorized into two types – primary and secondary. Primary microplastics are tiny particles and microfibers that are shed from commercial products such as cosmetics, clothing, and other textiles, and also fishing nets. Secondary microplastics are particles that result from the breakdown of larger plastic items, such as water bottles. This breakdown can be caused by exposure to environmental factors, such as sun's radiation and ocean waves. Researchers found that secondary microplastics make up the majority of microplastics.

Microplastic contamination has been found in natural freshwater systems, including wetlands, lakes, and rivers around the globe. Lake Superior in North America, Swiss lakes in Europe, and Lake Taihu in China have been all found to contain large amounts of microplastics. By keeping in mind the importance of microplastics we conducted two experiments. In the first experiment we evaluated the efficacy of different filter media in retaining microplastics and in the second experiment we evaluated the quality of Danube River water in the Budapest region in terms of the presence of MPs. It was concluded that in terms of the retention of MPs the size of the filter media along with the size of the MPs play a significant role. It was noted that the filter media with particle diameter <0.8 mm retained 100% of MPs followed by 85.05 and 84.47% by 1.0-1.6 mm and 0.8-1.0 mm filter media. It was observed that smaller-size filter media retained a significant proportion of MPs in the columns while a smaller portion of MPs was still passed through the columns and after visualization under a microscope, it was concluded that the passed MPs were of smaller size. From the second study concluded that the presence of microplastics in the water of the Danube in the Budapest area could not be found. Further investigations are needed.