

## **Microbial Diversity in Uruguayan Activated Sludge Systems: ¿Which Filamentous Bacteria are Present?**

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Uruguay is a food-producing country, so most industries are related to agricultural production. The wastewater treatment plants (WWTP) in cities and industries are generally separate, which gives us a great diversity of effluents that these plants treat. This work conducted an initial survey of activated sludge (AS) wastewater treatment plants in Uruguay with the aim of detecting operational problems. A total of 25 sewage and 19 industrial (WWTP) were surveyed. Eleven of these plants were selected, 4 sewage, 7 industrial (pulp, jam, slaughterhouse, winery), and monitoring was carried out over time. Sedimentation, floc formation, filamentous bacteria abundance and microbial community analysis (16S rRNA gene amplicon sequencing) were analyzed.

Plants from industries with seasonal production (e.g. winery, jam) present floc formation and sedimentation problems. Microbial communities were different depending strongly on the wastewater composition but also by plant (Fig.1).

Filamentous bacteria were detected in all plants, they were classified within 51 different genera, 46 of them within the Chloroflexota phylum. Other genera from known filamentous bacteria detected were *Neomegalonema*, *Ca. Alysiosphaera*, *Ca. Microthrix*, *Gordonia*, and *Thiothrix*.

To get more information from these filamentous bacteria, a metagenomic approach was performed in three of the plants (jam, malt and slaughterhouse). A total of 415 genomes with more than 50% completeness and less than 10% contamination were assembled. Among these, 44 MAGs belonged to the phylum Chloroflexota, 39 of which were classified within the class Anaerolineae. Work is underway to elucidate the metabolic role of these microorganisms.

Figure 1. Microbial community analysis by nm-MDS of 16S rRNA data from activated sludge samples.

