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## Contribution of the PROTOFILWW project to the knowledge of the activated sludge ecology: uncommon microfauna species

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### Abstract

Activated-sludge processes represent a component of the largest biotechnology in the world, gaining increased importance as a consequence of the expansion of the human population and the impact of human activities in the water quality. The importance and the role of the protozoa and little metazoa communities in the purification process of activated-sludge plants are well established. Even though, contributions to this field of knowledge are still scarce: very few studies have established reliable relationships between the protozoa and/or small metazoan communities and the operational conditions or physical-chemical parameters of the wastewater treatment plants (WWTP). The correlations between the plant performance or the operational conditions and the abundance of certain species have also been studied, leading to the development of a number of methodologies to assess the activated-sludge plant performance, being the Sludge Biotic Index (SBI), conceived by Madoni in 1994, the best known method to evaluate the performance of the WWTP. The present investigation being carried on aims at the identification of the microfauna (protozoa plus small metazoa) on 37 activated-sludge WWTP, of different regions of Portugal, operating under different environmental conditions. Data base on the prevalence, the abundance and the distribution of protists and little metazoa in activated-sludge systems will be presented. These project will also contribute to the systematic use of these methods when evaluating the performance of the biological treatment of wastewater, namely activated-sludge processes. Each of the 37 WWTP is being studied four times a year allowing for the identification of the causes of malfunctioning. In a different perspective, this will contribute for the answer of questions such as: Why do different microfauna species appear in similar conditions? Do the WWTP tend to maintain the same populations or do these change often? Are the changes cyclic or occasional? Do the less common species appear due to the systematic sampling or are they characteristic of certain emvoronmental conditions? Do they indicate geographical differences? Do the uncommon species appear in specific extreme conditions? Can these uncommon species can play a central role in the characterization of Portuguese WWTP?

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