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Prokaryotic and eukaryotic populations in activated-sludge

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Protozoa play a direct role by reducing through grazing the amount of freely-suspended and loosely-attached bacterial cells. Also, filamentous bacteria, although endangering the performance of wastewater treatment plants (WWTP), should be considered as normal components of the activated-sludge microbial community. Correlations between plant performance and the abundance of certain species have been studied, being the Sludge Biotic Index the best known method to assess the activated-sludge plant performance through the analysis of protozoa and small metazoan communities. However, few studies have established reliable relationships between the prokaryotic and eukaryotic populations.

The present work presents data on the prevalence, abundance and distribution of protozoa, small metazoa and filamentous bacteria on 37 activated-sludge Portuguese WWTP operating under different environmental conditions, during one year, including data on the correlations between the prokaryotic and eukaryotic components.

The most frequent protozoa were the crawling (CC) and the attached sessile (ASC) ciliates, being *Aspidisca cicada*, *Epistylis* spp. and *Microthorax* sp. the most abundant. The most frequent filamentous bacteria were Types 0041/0675, 0092, 1851, Nocardioforms, *Microthrix parvicella, Nostocoida limicola* II *and Haliscomenobacter hydrossis*; only the former four were found dominant in all samples. Correlations were found to be significantly positive ($p<0,05$) between *Nostocoida limicola* II and Type 0092 and negative between *Thiothrix* II and *Microthrix parvicella*. Correlations between filamentous bacteria and protozoa were significantly positive ($p<0,05$) for freely swimming ciliates (FSC) and Type 0092 and for flagellates (F)/*Thiothrix* II. Negative correlations were found for FSC and *Microthrix parvicella*, F and Nocardioforms.