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## **Protozoa grazing evaluation: a novel way to assess wastewater treatment performance?**

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Protozoa are recognized as essential to reach high-standard performances in wastewater treatment plants (WWTP), namely activated-sludge, by drastically reducing the number of dispersed bacteria and therefore the turbidity of the final effluent. Moreover, protozoa are sensitive to environmental variations and changes in these populations are known to affect the whole food-web, thus affecting the performance of the wastewater treatment plant.

The analysis of the protozoa populations is currently used to assess the performance of WWTP and the impact of protozoa grazing on the survival of particular groups of bacteria has been studied. Nevertheless, no studies exist on the possibility of simply evaluating the grazing rate of protozoa to assess the ecosystem health and therefore the WWTP performance.

The results obtained in the present study suggest that protozoa grazing reflects the health of the whole community inhabiting the aeration tank of WWTP and therefore can be used to evaluate the performance of the treatment system. Grazing was assessed by determining the ingestion of GFP (Green Fluorescent Protein) *E. coli* by the sessile ciliate *Epistylis* sp. using fluorescence microscopy. The samples were also inspected to allow for the determination of the Sludge Biotic Index (SBI), routinely used to evaluate WWTP performance.

The grazing rate clearly and significantly reflected the IBL evaluation. The study stands for the possibility of using grazing assessment as an alternative to the highly-expertise skills demanding SBI. More studies will be needed to investigate the possibility of using other species and/or genera.