

140 - Industrial Wastewater Treatment Plants (WWTPs): Hot Spots for the Description of New Ciliate Species. A Case Study from Tuscany (Italy)

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Ciliated protozoa are known to occur in wastewater treatment plants (WWTPs) and play an important role in wastewater biological treatment processes. Beginning in the 1970s, a great amount of research has been conducted on ciliates from WWTPs, with hundreds of publications on fauna, ecology and taxonomy. However, at the turn of the century, the number of works started to decline, exactly in the same period when integrative taxonomy started to become the standard for species identification. For this reason, emended diagnoses following modern criteria have yet to be done for most ciliates from WWTPs. In addition, most published studies have focused on sewage, and neglected industrial wastewater. Unlike domestic wastewater, industrial effluents are characterized by high organic and nitrogen loads, high salinity, and the presence of different recalcitrant or toxic pollutants. Indeed, WWTPs designed for treating wastewater from different industrial sources, such as paper mills, wineries or tanneries, present different characteristics, which additionally affect the composition and structure of the microbial community.

We investigated the species composition of a ciliate community in the Cuoidepur tannery WWTP (San Romano, Pisa, Italy), where the effluents of about 100 tanneries are treated. The biological section of this plant is constituted by a pre-denitrification tank and a nitrification-oxidation tank with an internal recirculation of 5–7 times the influent flow rate. Beginning in June 2018, we sampled both tanks three times. Preliminary results show that the species composition of ciliates in each tank stayed basically the same, and relatively stable; however, the dominant species changed over time. Until now, a total of 13 species have been found and investigated: *Aspidisca* sp., *Bakuella incheonensis*, *Euplotes* sp. 1, *Euplotes* sp. 2, *Holophyra* sp., *Metopus* sp., *Paramecium calkinsi*, *Phialina* sp., *Pseudochilodonopsis* sp., *Pseudovorticella* sp., *Thuricola similis*, *Trochilopsis australis*, *Zosterodasys* sp. Among them, based on the applied integrative taxonomic study, preliminary results suggest that three species, namely, *Euplotes* sp. 1, *Holophyra* sp. and *Phialina* sp., might be new species. Their detailed description will be provided in the presentation.