

MICROSCOPY AS A TOOL OF PERFORMANCE EVALUATION IN A NITRIFICATION TANK OF A MODIFIED LUDZACK ETTINGER PROCESS TREATING SWINE WASTEWATER

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Abstract: Microscopic examination of wastewater is a useful tool for a bioreactor evaluation since protozoa and metazoa are bioindicators of the biological process. The aim of this research was to establish the relation between physico-chemical parameters and the microorganisms present in a swine wastewater treatment aerobic tank since no data for this kind of effluent is available in literature. Samples (n = 41) were collected directly from the nitrification tank of a Modified Ludzack Ettinger process, once or twice a month. Samples were analyzed using an optical microscope, with an objective lens of 10X and ocular lenses of 10X. After the microscopic examination, the data were statistically evaluated by Spearman Correlation against the following parameters: dissolved oxygen (DO), pH, temperature (T), total organic carbon (TOC), settling solids (SS), sludge age (SA), total and volatile suspended solids (TSS and VSS), volumetric sludge index (VSI), alkalinity, total ammonia nitrogen (TAN), nitrite, nitrate, free ammonia (FA). TOC, TAN and nitrate showed negative correlation (Spearman Correlation) with attached ciliates (significance level of 95%, $p = 0.05$), while T, TOC, TAN, nitrite and nitrate showed negative correlation with crawling ciliates. It was concluded that swine wastewater has a different microbiology compared to sanitary wastewater since even at relatively high concentrations of N (low C/N ratio) attached and crawling ciliates were observed.

Keywords: Microscopy, swine wastewater, protozoa, metazoa, bioindicators.



Video presentation