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BOOK OF ABSTRACTS

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I1. Environmental Microbiology and Biotechnology

P58. Aerobic granular sludge has EPS-producing bacteria able to tolerate salt

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The aerobic granular sludge (AGS) process is a promising biotechnology which relies on the formation of compact biomass granules. Granulation occurs due to the overproduction of extracellular polymeric substances (EPS) by some microbes in response to stress conditions. EPS protect bacteria from the effect of toxic or inhibiting compounds present in the wastewater, such as salts. One of the current challenges is to use the AGS process to treat high salinity wastewater, commonly produced by agro-food and chemical industries. The main objective of this study was to screen for EPS-producing bacteria bacteria in an AGS reactor treating synthetic saline wastewater contaminated with a toxic compound. Several bacterial isolates were obtained from the reactor biomass. Genomic DNA was extracted and isolates (30) were grouped according to species similarity, based on RAPD profiles. Isolates displaying unique profiles (15) were subsequently identified by 16S rRNA gene sequencing analysis. Bacteria highly related to *Pseudomonas*, *Aeromonas*, *Stenotrophomonas*, *Flavobacterium* and *Pseudoxanthomonas* were obtained. Isolates SG4 (*Stenotrophomonas*) and FG10 (*Flavobacterium*) belong to bacterial genera associated to EPS production in granules. These were selected for growth and biofilm formation assays with increasing NaCl concentrations (0 to 35 g L^{-1}). Both isolates were able to grow in the presence of 35 g NaCl L^{-1}, despite at a lower growth rate. Although salt increase affected biofilm production, SG4 was the best biofilm producer. EPS production by SG4 in the presence of 10 and 20 g L^{-1} of NaCl was compared. EPS was extracted and the content in proteins, humic acids and carbohydrates was quantified. SG4 was able to produce more EPS in the presence of 10 g L^{-1} (123 mg g^{-1} VSS) compared to 20 g L^{-1} of NaCl (77.6 mg g^{-1} VSS).
EPS-producing bacteria with ability to tolerate high salinity were retrieved from an AGS process treating synthetic wastewater. Further research is required to gain more knowledge on these bacteria and their importance for the robustness of a process treating saline wastewater.