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P-121 - EPS PRODUCTION BY BACTERIA FROM HIGH SALINITY WASTEWATER

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Background

Aerobic granular sludge (AGS) is a promising technology for treating industrial wastewater, possessing higher biomass retention and tolerance to toxic substrates than conventional activated sludge systems. The presence of extracellular polymeric substances (EPS) in the aerobic granules structure increases the bacterial protection towards stress conditions and the stability of granules. Several industrial wastewaters contain high salt concentrations in their composition, which can inhibit the bacteria responsible for nutrients removal in the AGS process [1]. A novel strategy to increase the robustness of the system to high salinity is to bioaugment the aerobic granules with halotolerant bacteria with ability to produce EPS. Using a robust AGS process, extra value can be obtained from the wastewater since the EPS from the biomass can be recovered and used as new biomaterials in different applications. The aim of the present study is to investigate the feasibility of EPS production by halotolerant bacteria isolated from high salinity wastewater collected in a fish canning industry.

Method

Bacterial isolates obtained from the saline water were grouped according to species similarity, based on RAPD profiles. Isolates displaying unique RAPD profiles were subsequently identified by 16S rRNA gene sequencing analysis. The potential for EPS production by isolates presenting a sticky growth on agar plates is currently being evaluated. The content in proteins, humic acids and carbohydrates of the extracted EPS is quantified using reference methods.

Results & Conclusions

The obtained isolates are closely related to bacterial strains from the *Acinetobacter*, *Psychrobacter*, *Arthrobacter*, *Bacillus*, *Exiguobacterium* and *Kocuria* genera. The isolated halotolerant bacteria present different ability to produce EPS. The most promising EPS producers will be used for bioaugmentation of an AGS process treating high salinity wastewater. Valorization of the wastewater through EPS recovery from the AGS is in line with the circular economy concept.

References & Acknowledgments

[1] Amorim CL, Moreira IS, Duque AF, Van Loosdrecht MCM, Castro PML (2017) Aerobic Granular Sludge: Treatment of Wastewaters Containing Toxic Compounds. In: Val del Río A, Campos Gómez JL, Mosquera-Corral A (eds) Technologies for the Treatment and Recovery of Nutrients from Industrial Wastewater. IGI Global, pp 231-263.

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