



“Iron-stimulated production and antimicrobial potential of a novel biosurfactant produced by a drilling waste-degrading *Pseudomonas citronellolis* strain”

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Summary

Herein, a *Pseudomonas citronellolis* strain was isolated from drilling waste (DW). This strain could utilize DW as the sole energy and carbon source to produce biosurfactants (BSs), thus substantially reducing bioprocess cost. The BS produced was thermally stable, amorphous and includes a peptide structure. FeSO_4 , FeCl_3 and $\text{Fe}(\text{NO}_3)_3$ were supplemented at various concentration levels. The limit between increase of BS formation and toxicity was at 0.1 mM. While FeCl_3 over-doubled the BS production yield, determining an optimization strategy of BS production. The BS was then partially purified and used against gram-negative and positive multi-drug resistant bacteria. The minimum inhibitory concentration was also defined. The antimicrobial properties of the BS established its effectiveness and down-stream processing cost reduction, as no additional purification steps were necessary. The study demonstrates a sustainable low-cost bioprocess towards a circular bioeconomy, while the BS holds great potential as a novel compound with antibiotic and disinfectant-like action.

Short Bio

Dr Argyro Tsipa is a Lecturer in Environmental Biotechnology at the Department of Civil and Environmental Engineering at University of Cyprus since September 2019. She founded the Laboratory of Environmental Biotechnology in 2020 while she is member of the academic council of Nireas International Water Research Center at University of Cyprus. Before her current appointment, she was a research associate at the UK's National Centre for Synthetic Biology and the London Biofoundry at Imperial College London, UK. She holds a PhD in Bioprocess Systems Engineering and a MSc in Advanced Chemical Engineering from Imperial College London, UK. She obtained her diploma in Chemical Engineering from the National Technical University of Athens, Greece. Dr Tsipa research interest lies on combating environmental pollution through biological systems engineering.

