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## BOOK OF ABSTRACTS



## 11. Environmental Microbiology and Biotechnology

### P42. Ultrafiltration after ozonation of urban wastewater: tackling bacterial regrowth

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Water scarcity issues could be mitigated if treated wastewater was reused in different applications (e.g. agricultural irrigation and aquifer recharge). In some cases, after biological treatment (conventional activated sludge), the final effluent of urban wastewater treatment plants (UWWTPs) do not meet quality criteria for water reuse, mainly in terms of microbiological parameters, being required an additional tertiary treatment for wastewater disinfection.

Advanced oxidation technologies (AOTs), such as ozonation (O<sub>3</sub>), have recently emerged as effective tertiary treatments for the removal of both chemical and biological contaminants in UWWTPs. However, previous studies demonstrated that some bacteria are capable of cell-injury repair and can regrow after the O<sub>3</sub> process [1]. A suitable approach that could remove these bacteria from treated wastewater would be a physical separation step, namely a membrane technology.

This study aimed at evaluating the ability of a pilot scale reactor to remove the secondary treated wastewater bacteria with ultrafiltration (UF) membranes after O<sub>3</sub>. The UF step performed after O<sub>3</sub> contributed to remove coliforms and enterococci to values below the detection limit even after 7 days storage.

According to the Portuguese standards of water for irrigation (DL 236/98) [2], this stored treated water is suitable crop irrigation promoting a sustainable management of water resources and addressing water scarcity issues.

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#### References

[1] I. Michael-Kordatou, P. Karaolia, D. Fatta-Kassinos, *Water Research*, 129 (2018) 208.

[2] Decreto-Lei nº 236/98 de 01-08-1998. Diário da República - Anexo XVI - Qualidade das águas destinadas à rega, 1988