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**BOOK OF ABSTRACTS**



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**Strain *Rhodococcus* sp. ED55 isolated from a WWTP in Macao degrades  $\beta$ -estradiol and removes toxicity of treated effluents** OC 03

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### Abstract

$\beta$ -estradiol (E2) is an endogenous steroid hormone excreted by humans and animals. Due to incomplete removal on wastewater treatment plants (WWTP) and animal waste disposal, this micropollutant reaches the environmental compartments, being detected in WWTP effluents, surface water, soil and sediments [1]. This is an issue of great concern due to its endocrine disruption potential. The main objective of the present study was to evaluate the biodegradation of E2 by a bacterial strain – *Rhodococcus* sp. ED55 - isolated from the sediments of a discharge point of a WWTP in Coloane, Macau. Biodegradation experiments were performed in synthetic mineral medium and in wastewater from a municipal WWTP (Parada, Maia – Portugal). Strain ED55 was able to completely degrade the supplied amount of E2 in few hours, both in synthetic medium and in municipal wastewater. Estrone (E1) was identified as intermediate degradation metabolite, by comparison with a commercial standard. The detection and identification of other biodegradation intermediates by UPLC-QTOF/MS/MS is ongoing, aiming at elucidation of the metabolic pathway of degradation. Moreover, the bioaugmentation with E2 significantly improved the natural attenuation of the compound in municipal wastewater. The acute test with luminescent marine bacterium *Vibrio fischeri* revealed elimination of the toxicity of the treated effluent. Bacterial strain *Rhodococcus* sp. ED55 can potentially be applied for bioaugmentation of bioreactors for the enhancement of wastewater treatment.

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