

***CHLORELLA VULGARIS* USED FOR PHYCOREMEDIATION OF WATER WITH FEMALE HORMONE**

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Abstract

Global attention has been drawn to the increasing discharge of emerging micropollutants, especially pharmaceutical compounds, into the aquatic environment. Among pharmaceutical compounds, female hormones such as 17- α ethinylestradiol (EE2, synthetic hormone) have also been identified as pseudo-persistent and biologically active in aqueous media. Wastewater treatment plants (WWTP) have been considered one of the main routes of entering EE2 into the aquatic environment. In principle, conventional WWTPs are not designed to completely remove hormones and other pharmaceutical compounds. The use of microalgae for phycoremediation has been recognized as a potentially effective process to remove/biodegrade target contaminants from wastewater due to its efficiency, low cost operation (low input energy) and production of valuable biomass (for biofuels). The main objective of this investigation was to assess the potential of the microalgae *Chlorella vulgaris* in reducing the concentration of the hormone EE2 in aqueous medium, as well as to evaluate how the exposure to EE2 affects the production of algal biomass, for future uses. After 168h exposed to EE2 (50 $\mu\text{g L}^{-1}$), *C. vulgaris* reduced 59% of the EE2 concentration in the mineral water, in contrast to the reduction of only 24% in the control (absence of microalgae) under the same conditions. Most of the EE2 concentration reduction in the presence of microalgae was observed during the first 24 h compared to the control (mostly abiotic processes). Biomass production showed considerable fluctuations during the assay. However, when compared to the control, no significant difference was observed, indicating the capabilities of *C. vulgaris* to tolerate and grow in high concentrations of EE2 in these experimental conditions. The results corroborate with previous studies and reinforce the potential of microalgae as effective agents, which can later be explored to remove hormones and other drugs from wastewater as a final polishing step.

Keywords: *Chlorella vulgaris*, microalgae, 17- α ethinylestradiol, Phycoremediation, Biomass production.