DRY BIOMASS OF MICROALGAE *NANNOCHLOROPSIS OCULATA* APPLIED TO THE BIOSORPTION OF THE FEMALE HORMONE 17α-ETHINYLESTRADIOL (EE2)

***Alenne Prince Junqueira de Moraes*[1,2]**
***Carine Ferreira Marques*[1]**
***Thaís Barros Matheus Pinho*[1]**
***Cláudia Maria Luz Lapa Teixeira*[2]**
***André Luís de Sá Salomão*[1]**

[1)] Dept. Sanitary and Environmental Engineering, Rio de Janeiro State University - UERJ, Brazil.
[2)] Chemical and Biotechnology Division, National Institute of Technology – INT, Brazil

Abstract
Pharmaceutical and personal care products (PPCPs) are anthropogenic contaminants frequently detected in the environment in recent decades. These emerging contaminants are generally found in low concentrations in aquatic matrices (ng/L) and are not sufficiently removed by conventional wastewater treatment technologies. Among these, endocrine disruptors stand out, such as the synthetic hormone 17α-ethinylestradiol (EE2), widely used in the pharmaceutical industry, mainly in contraceptives and hormone replacement therapies. Therefore, the use of selected species of microalgae, fungi and bacteria has been recognized as potentially effective in removing or biodegrading target contaminants in effluents. Thus, several microalgae species have been investigated as potential sorbent agents for the removal of micropollutants. Sorptive processes offer greater flexibility, the possibility of reusing the treated effluent and the possibility of regeneration of the adsorbent, enabling good operational savings. In addition, many microalgae species synthesize bioactive compounds of high economic value, such as polyunsaturated fatty acids (PUFAs), carotenoids, and proteins. In this study, the efficiency of removing the EE2 hormone from an aqueous matrix by biosorptive processes was investigated using the biomass of the microalgae *Nannochloropsis oculata* under two conditions: dry and residual, after the extraction of total lipids. Dry biomass promoted removal in the range of 52 to 74% of contaminants (EE2), while residual biomass removed between 42 and 64%. The process was better described for both conditions by the Freundlich isotherm model. From the quantification of the lipid content of *N. oculata*, a percentage of 18.46% of total lipids in the biomass was obtained, and it was verified that the species is a good source of fatty acids of significant commercial value. The use of dry microalgae biomass as an adsorbent for emerging contaminants, combined with the extraction of compounds of economic value, constitutes a sustainable alternative applied to the concept of biorefinery.

Keywords: Emerging contaminants, Biosorptive processes, Bioproducts

ISBN: 978-91-89460-85-0