

Determination of ecotoxicity of individual and binary mixtures of pharmaceutical and personal care products (PPCPs) by bioluminescence tests on *Vibrio fischeri* bacteria

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In the last years, the use of a large amount of synthetic chemicals, specifically pharmaceuticals and personal care products (PPCPs), have led to the presence of these compounds in the water system (natural water, wastewater and drinking water), once they are metabolized and excreted by living organisms. The water treatment plants have not being designed to remove these type of compounds efficiently, thus, the detection of these pollutants in water has been recognized as one of the emerging issues in environmental chemistry, being of utmost importance to know their effects and negative impacts on the environment.

The main objective of this study is to determine the individual and mixture ecotoxicity of two widely consumed PPCPs using Microtox[®], by quantification of the bioluminescence inhibition in the marine bacterium *Vibrio fischeri*, commonly used in short term toxicity tests.

In this work, edaravone and triclosan, two drugs approved by the Food and Drug Administration of the USA (FDA), have been studied. The edaravone is a novel potent free radical scavenger that has been clinically used to reduce the neuronal damage following ischemic stroke. The triclosan is a diphenyl ether derivative used in cosmetics and toilet soaps as an antiseptic. The acute toxicity of these PPCPs, has been tested at two different times of exposition (5 and 15 minutes), by estimation of the half-maximal effective concentration (EC50), for each individual reagent or in combination at different concentrations.

The results obtained showed that the EC50 of each compound depends on the exposition time, and on the solution tested, containing one reagent individually or a combination of both. Tests with mixtures of the PPCPs revealed higher toxicity than the effects measured individually. When tested individually, the toxicity of edaravone increased with the exposition time, while triclosan seems not to be too dependent on this factor.

Considering the potential impact of these PPCPs in the aquatic environment, further investigations are being conducted to elucidate their behaviour, including respirometry assays to determine their impact on wastewater treatment plants.

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