

TOXICITY OF SULCOTRIONE PHOTOPRODUCTS MIXTURE TOWARDS *VIBRIO FISCHERI* IN THE AQUATIC ENVIRONMENT

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Abstract: Photodegradation by sunlight radiation is one of the most destructive pathways for pesticides after their application in the field. The generated photoproducts can exhibit various toxicological properties and affect non-target organisms. Sulcotrione is a herbicide believed to be a relatively non-toxic alternative to atrazine herbicides used on corn fields.

Despite many tests required for placing plant protection products on the market, it still happens that transformation pathway and the toxicological profile of these compounds is not fully understood. The results presented in this article are complementary to the research performed by a research group from National Center for Scientific Research (CNRS) at the University of Blaise Pascal (Auvergne, France). Sulcotrione is one of main herbicides used to protect the maize plantations in the region of Auvergne (France), as well as in Poland.

As part of the experiments, the distribution of sulcotrione under the influence of polychromatic radiation (fluorescent lamp, $\lambda > 295$ nm, suitable for environmental tests) in aqueous solution of pH 6.5 was tested. The main products of these reactions were 1H-xanthene-1,9-dione-3,4-dihydro-6-methylsulfonyl (CP) and 2-chloro-4-methylsulfonylbenzoic acid (CMBA), which are the result of intra-molecular cyclization of sulcotrion and hydrolysis product of sulcotrion. These products were quantified by using HPLC-diode array detector analysis. The studies clearly show an increase in toxicity towards tested organism (bacterium *Vibrio fischeri*) with the increase of irradiation time and appearance of the photoproducts.

The results suggest that the observed increase in toxicity may be rather attributed to the occurrence of the same minor photoproducts than to the presence of the major photoproducts (CP and CMBA)

Identification of the minor photoproducts could not be performed using the current instrumental equipment.