

Accepted Manuscript

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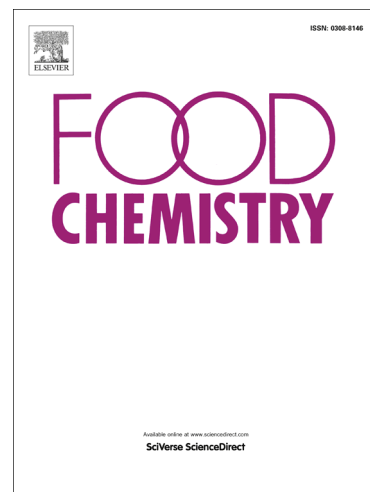
PII: S0308-8146(18)31367-0
DOI: <https://doi.org/10.1016/j.foodchem.2018.07.207>
Reference: FOCH 23322

To appear in: *Food Chemistry*

Received Date: 11 July 2017
Revised Date: 10 April 2018
Accepted Date: 29 July 2018

Please cite this article as: Savić, J.Z., Petrović, S.Z., Leskovic, A.R., Lazarević Pašti, T.D., Nastasijević, B.J., Tanović, B.B., Gašić, S.M., Vasić, V.M., UV-C light irradiation enhances toxic effects of chlorpyrifos and its formulations, *Food Chemistry* (2018), doi: <https://doi.org/10.1016/j.foodchem.2018.07.207>

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UV-C light irradiation enhances toxic effects of chlorpyrifos and its formulations

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Abstract

UV-C irradiation is widely used in the food industry. However, the health effects from dietary exposure to the irradiated pesticide residues retained in foodstuffs are underestimated. In this study, technical chlorpyrifos (TCPF) and its oil in water (EW) and emulsifiable concentrate (EC) formulations were irradiated by UV-C, and their photodegradation products were subjected to toxicity assessment, including determination of acetylcholinesterase (AChE) activity, genotoxicity and oxidative stress using human blood cells as a model system. Toxicity studies were performed using the chlorpyrifos concentrations in the range of those proposed as the maximum residue levels in plant commodities. TCPF, EW and EC photodegradation products induced DNA damage and oxidative stress, and their genotoxicity did not decrease as a function of irradiation time. Irradiated TCPF and EC are more potent AChE inhibitors than irradiated EW.

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