

TOXIC INFLUENCE OF ENVIRONMENTAL POLLUTANTS ON GREEN LEAFY VEGETABLES*

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Abstract: The influence of environmental stress factors on both crop and wild plants of nutritional value represents a very important research topic. Continuously worldwide use of drugs is conducting to significant pollution of the environment. Understanding the effects of the important drugs on plant physiological activity and structural modification is still limited, especially at environmentally relevant concentrations. The aim of the present work was to investigate the influence of the nonsteroidal anti-inflammatory drugs (NSAIDs) on foliage photosynthesis, secondary metabolites and ultrastructure of the leaf of orache (*Atriplex patula* L.), lettuce (*Lactuca sativa* L.) and spinach (*Spinacia oleracea* L.). All green leafy vegetables selected for this study were grown in controlled conditions and treated with solution of different concentrations (0.1 mg L⁻¹- 1 mg L⁻¹) of diclofenac, ibuprofen and naproxen. Regarding the physiological characteristics, all the selected NSAIDs decreased the stomatal conductance to water vapour and net assimilation rate of *Lactuca sativa* L. Also, these two physiological plant characteristics decreased in the case of *Atriplex patula* L. upon ibuprofen exposure. The analyzed volatile organic compounds (monoterpene and lipoxygenase pathway products) significantly increased with the increasing of the NSAIDs concentration used for vegetables treatment. The volatile organic compounds emitted represented a sensitive and promising tool to assess toxicity of selected NSAIDs. Also, the ultrastructural analysis demonstrated that NSAIDs negatively affect the selected vegetables. In the case of *Atriplex patula* L. treated with diclofenac high mitochondrial content was observed. Ibuprofen and naproxen highly affected the chloroplast of *Atriplex patula* L. The treatment of *Spinacia oleracea* L. with diclofenac conducted to electron dense deposit inside a chloroplast and ibuprofen conduct to strongly vacuolized cells. *Lactuca sativa* L. was the most affected vegetable with obvious changes in the structure of the leaves treated with ibuprofen.

Thus, the results obtained contribute for a better understanding of the adverse effects of these drugs on the environment and awareness a responsible consumption of drugs.

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