

Paramecium as a Model for the Evaluation of Toxicity (Growth, Total Proteins, Respiratory and GSH Bio Marker Changes) Observed after Treatment with Essential Oils Isolated from Artemisia herba-alba Plant of Algeria

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Abstract : Recently, some natural products such as essential oils (EOs) have been used in the fields as alternative to synthetic compounds, to minimize the negative impacts to the environment. This fact has led to questions about the possible impact of EOs on ecosystems. Currently in toxicology, the use of alternative models can help to understand the mechanisms of toxic action, at different levels of organization of ecosystems. Algae, protozoa and bacteria form the base of the food chain and protozoan cells are used as bioindicators often of pollution in environment. Unicellular organisms offer the possibility of direct study of independent cells with specific characteristics of individual cells and whole organisms at the same time. This unicellular facilitates the study of physiological processes, and effects of pollutants at the cellular level, which makes it widely used to assess the toxic effects of various xenobiotics. This study aimed to verify the effects of EOs of one famous plant used tremendously in our folk medicine, namely Artemisia herba alba in causing acute toxicity (24 hours) and chronic (15 days) toxicity for model cellular (Paramecium sp). To this end, cellular's of paramecium were exposed to various concentrations (Three doses were chosen) of EOs extracted from plant (Artemisia herba alba). In the first experiment, the cellular s cultures were exposed for 48 hours to different concentrations to determine the median lethal concentration (DL50). We followed the evolution of physiological parameters (growth), biochemical (total proteins, respiratory metabolism), as well as the variations of a bio marker the GSH. Our results highlighted a light inhibition of the growth of the protozoa as well as a disturbance of the contents of total proteins and a reduction in the reduced rate of glutathione. The polarographic study revealed a stimulation of the consumption of O₂ and this at the treated cells.

Keywords : essential oils, protozoa, bio indicators, toxicity, Growth, bio marker, proteins, polarographic

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