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## Study of the influence of ZnO on the enzymatic biomarkers of a biological model plant as bioaccumulative species of heavy metals (*Phragmites australis*)

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In recent decades, the increase in human activities has been accompanied by environmental dispersion of considerable quantities of pollutants such as heavy metals. The accumulation of heavy metals in ecosystems has led, over the years, the deterioration of the quality of the environment, the decline of forests and the decrease in agricultural productivity. Heavy metals persist in the environment for long periods. Plants are directly exposed to these elements whose toxic potential are undeniable and pass to humans through the food chain. The research aimed to understand the behavior of aquatic plants subjected to xenobiotics, a macrophyte plant "*Phragmites australis*" from the region of Souk-Ahras, is treated with three concentrations based on zinc oxide (ZnO) (3, 6 and 12 nmol•mL<sup>-1</sup>): for seven, 14 and 21 days. A measurement of certain enzymatic parameters characteristic of oxidative stress allowed us to evaluate not only the effect of zinc oxide but also the behavior of *Phragmites australis* subjected to this nanometric molecule. The effects of these NPs on enzymatic biomarkers (APX and CAT) are studied. The statistical analysis of the results obtained showed no significant differences in all the parameters measured, between leaves and roots.