Behavior of Phragmites australis (CAV.) Trin. Ex Steud used in phytoremediation of wastewater contaminated by cadmium

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**ABSTRACT**

Direct use of green plants to stabilize or reduce contamination in soils, surface water, or ground water has gained increasing popularity in both academic and practical fields. Phytoremediation is a low-cost and friendly technology to the environment, not only for the elimination of heavy metals but also for the various pollutions. This study investigated the effect of cadmium chloride (CdCl\textsubscript{2}) on chlorophyll and lipids contents and evaluated the activity of guaiacol peroxidase (GPOX) in Phragmites australis aerial and root part. Known as common reed, this plant is widely used for the treatment of wastewater contaminated with heavy metals. The analysis of those selected physiological parameters has allowed understanding cellular behavior in the presence of various concentrations of cadmium. The results showed that low doses of CdCl\textsubscript{2} induced a significant increase in total chlorophyll content (A + B) unlike the other two doses, as well it was demonstrated that CdCl\textsubscript{2} induced a negative dose-dependent effect on lipid content. However, the decreased level of fat contents was less important in roots than in leaves. The effects of CdCl\textsubscript{2} on enzymatic activity in leaves showed a very highly significant inhibition of GPOX activity for all used concentrations; contrarily in roots, an increase in the activity was recorded. Following this study, the increased activity of GPOX in roots partly explains the ability to accumulate CdCl\textsubscript{2} in this part of the plant especially if we know that GPOX has a role in cellular protection against oxidative stress imposed by heavy metals and cell wall lignifications where heavy metals adsorbed to minimize penetration inside cells.

**Keywords:** Cadmium chloride; Phytoremediation; Enzymatic activity; Heavy metals

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