

Role of Proton Pumps in *Brachiaria humidicola* cv. *BRS Tupi* in  
Resistance / Tolerance to Cadmium Stress

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**INTRODUCTION:** The proton pumps are protein complexes that constitute the primary transport system in biological membranes, responsible for generating electrochemical gradient. This occurs because the transport of ions against a concentration gradient. This movement of ions is highly selective and extremely important for the maintenance of cellular energy (Harold, 1986). Pump protons that couple the hydrolysis of pyrophosphate into inorganic phosphate transport ions  $H^+$  are called  $H^+$ -pyrophosphatases ( $H^+$ -PPase). These pumps can exhibit different mechanisms of resistance and tolerance to stress, such as heavy metals. These cause toxic effects that can cause oxidative damage or inactivate the antioxidant cell system (Mannazzu et al., 2000).

**OBJECTIVES:** Therefore, the objective of this study was to evaluate the role of  $H^+$ -pyrophosphatases in *Brachiaria humidicola* cv. *BRS Tupi* when these were submitted to Cadmium stress.

**MATERIALS AND METHODS:** The activities of these pumps  $H^+$ -pyrophosphatases were determined by hydrolysis of pyrophosphate (PPi) and also by a decrease ACMA's fluorescence.

**DISCUSSION AND RESULTS:** Using these methods it was possible to analyze that hydrolysis activity of the  $H^+$ -pyrophosphatases wasn't inhibited at concentrations of 10 and 100 ppm Cadmium compared with the Control. Furthermore, the ion transport capability of the  $H^+$ -pyrophosphatases at a concentration of 10 ppm Cadmium showed a small decrease in maximum amplitude  $H^+$  transport 5,87% compared with the Control. Additionally, at a concentration of 100 ppm Cadmium it was also observed a small decrease of the maximum amplitude  $H^+$  transport 4,3% compared with the Control. These results can be mechanisms of the plant to survive stress conditions.

**CONCLUSION:** These results can be mechanisms of the plant to survive stress conditions. This may be feasible for the remediation of contaminated areas.

**Keywords:** proton pumps,  $H^+$ -pyrophosphatases, Cadmium