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Antioxidant enzymes activity in *Guzmania monostachia* (Bromeliaceae) plants cultivated *in vitro* under nutrient deficiencies

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The exposure of plants to abiotic stresses, including nutrient deficiencies, can increase the production of reactive oxygen species (ROS), which cause damage that could lead to cell death. These molecules are eliminated by an antioxidant system, including enzymes such as superoxide dismutase (SOD) and ascorbate peroxidase (APX). The bromeliad *Guzmania monostachia* is epiphytic and subject to periods of nutritional deficit, which may induce antioxidant defense activity. The aim of this study was to verify the activity of the enzymatic antioxidant system in plants of *G. monostachia* cultured *in vitro* in response to nutrient deficiencies. Plants were kept in the same culture medium for two years (nutritional deficiency stress treatment); another batch was subcultured into new medium every six months during two years (control). Enzyme extraction was carried out with 1 mM potassium phosphate buffer (pH 7.5), 1 mM EDTA, 50 mM NaCl, 1 mM ascorbic acid and 2% PVPP, using 2 mL for 0.25 g shoot fresh mass. Samples were centrifuged at 11.000 g at 4 °C for 15 min. The supernatant was used for the analysis of APX and SOD, and dosage of total protein. Means were evaluated by paired *t* test with 5 % significance. All plants survived in control and nutritional stress conditions. Results indicated higher SOD specific activity in stressed plants, but no difference was found in APX activity between the treatments. The increase in SOD indicates dismutation of superoxide radicals, which produces H₂O₂ in the process. APX is responsible for H₂O₂ detoxication in plant tissues. APX concentration in stressed and control plants were equal, therefore it might have been sufficient to keep H₂O₂ at tolerable levels. The increase in SOD activity may have contributed to the plants survival during exposure to nutrient deficit, indicating the importance of SOD in the antioxidant defense of *G. monostachia*.

Key words: oxidative stress, SOD, epiphytic, Bromeliaceae.

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