GAPC1 and HSP90.1 proteins may have an important role in the oxidative stress in *Saccharum* spp.

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Abiotic and biotic stresses have a huge impact in sugarcane plant growth as its affects yield production. These stress conditions change plant development. Moreover, one of its consequences is the increase of H2O2 production as well as other reactive oxygen species (ROS). In order to understand better this oxidative stress, then sugarcane plants were grown in H2O2 for 8 hours. After that, roots and leaves were isolated for proteomic analysis. The data obtained showed a differential protein expression for Glyceraldehyde-3-phosphate dehydrogenase (GAPC1) and Heat shock protein 90.1 (HSP90.1) in the oxidative stress condition. Due to this, these two proteins were chosen for further analysis using bioinformatics tools in this work. The results obtained allowed us to observed that these two proteins GAPC1 and HSP90.1 make an interactome. Furthermore, it was observed five proteins with intersection in this interactome: SCE1, GRF1, Q38942, RAD23A and UBQ3. This data allowed us to propose a following model for action: the H2O2 may inactive the GAPC1 protein, which promotes its oxidation and induce the PLDδ activity, then the phosphatic acid is accumulated in the cell. When GAPC1 is reduced, the glyceraldehyde-3-phosphate is converted to 1,3-bisphosphoglycerate and NADH is produced. Then, GAPC1 oxidation/reduction are a result from stress condition, which may induces SCE1 protein to modify the signal transduction in cytosol, consequently UBQ3 protein may interacts to RAD23A in order to correct possible lesion in DNA due to oxidative stress. Besides, the nucleoporin Q38943 may have a role as exportation factor for mRNAs promoting GRF1 to regulated DNA expression in response to abiotic stress. Moreover, the role for HSP90.1 may be related to keep protein stable as well as preparing plant to be able to tolerate this stress condition. In a nutshell, this model showed how these proteins may act in the cells in order to reduce the negative impact from oxidative stress in cell, which will be important in plant metabolism to tolerate these adverse conditions.

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