Determination of Catalase Activity in Seeds of Physic Nut (Jatropha curcas L.) in Response to Water Restriction Conditions

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Physic nut is a non-edible oilseed crop belongs to the Euphorbiaceae family described as a great promise in biodiesel production as well as species that tolerate stress. Stress tolerance is mediated by a complex network including antioxidant enzymes such as catalase, which is responsible for detoxification of reactive oxygen species. The aim of this study was to determine catalase activity in seeds under water restriction conditions. Germination was carried out in gerbox containers soaked with water and PEG 8000 solution (-0.8 MPa) at controlled conditions (25ºC, no photoperiod). Three replicates (20 seeds) were germinated under each condition and samples were collected every two days during 14 days. Total proteins were extracted with 0.1 M potassium phosphate buffer (pH 7.4), and protein concentration was determined according to Bradford. Catalase activity was determined by the kinetics of degradation of hydrogen peroxide, during 180 seconds by spectrophotometry (240nm) and expressed as $U_{CAT}\text{ng}^{-1}$ of protein. It was observed 95% of germination in water soaked seeds and no germination in PEG soaked seeds, as well as significant decrease in catalase activity in the seeds treated with PEG 8000. Catalase activity was 461% higher in control than PEG conditions. It was found that catalase activity is more stable, but reduced when seeds are treated with PEG 8000 instead of water. In conclusion, the data show that catalase is a key enzyme during the germination of physic nut and its activity has decreased during germination under water restriction conditions.

Word Keys: antioxidant activity, biofuel, hydric stress, medicinal plants, reactive oxygen species.

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