Effects of Osmoconditioning on *Ricinus communis* L. Seed Germination and Seedling Vigor, Superoxide Dismutase Activity and Expression Profiles.

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Introduction: *Ricinus communis* is an oilseed species of commercial importance for family farmers in the Northeastern semiarid region of Brazil, where severe drought periods may impact crop establishment, development and productivity. Water deprivation generally leads to production of reactive oxygen species (ROS) which may damage DNA, proteins, lipids, among other macromolecules, and arrest cellular metabolism. Osmoconditioning is a (restrictive) partial seed hydration process which allows activation of pre-germinative metabolism while preventing radicle protrusion, i.e. germination. Superoxide dismutase (SOD) enzyme constitutes the first line of defense against water restriction stresses protecting cells against potential negative consequences caused by ROS, categorized into 3 main groups based on the cofactor at the active site (Cu/Zn, Mn and Fe). **Objetives:** This study aims to compare the responses of two *R. communis* genotypes (MPA34 and PARAGUAÇU) when submitted to osmoconditioning by means of seed germinability and seedling vigor evaluations, SOD enzyme activity and gene expression**. Material and Methods:** Effects of water restriction were evaluated by osmoconditioning seeds in different polyethylene-glycol (PEG8000) solutions (-0.1 to -1.0MPa, during 7d, 25°C) and subsequent rehydration (0,0MPa, 25°C). Activity of SOD isoforms and gene expression will be evaluated by spectrophotometry and qPCR, respectively. **Results and Discussion:** Germination was prevented by osmoconditioning seeds at water restriction from -0,2MPa onwards in both genotypes, whereas there seemed to occur seed *priming* effects at -1,0MPa as characterized by enhanced seed germinability and seedling vigor on PARAGUAÇU, but not on MPA34 genotype. The different responses of both genotypes to osmoconditioning at different water restriction levels appears to be explained by the SOD activity and expression profiles. **Conclusions:** SOD isoforms activity and gene expression profiles contributes to a better understanding of the mechanisms of osmoconditioning in both genotypes, and may lead to useful markers for breeding and development of new drought tolerant genotypes.

Key words: Castor bean, seed osmopriming, ROS, SOD.

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