

ABSTRACT - PLANT PHYSIOLOGY

A PROMISING METHOD TO DECREASE THE DESICCATION-SENSITIVE BEHAVIOR OF EUGENIA ASTRINGENS (MYRTACEAE) SEEDS THROUGH IMBIBITION

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Eugenia astringens (Myrtaceae) is a non-domesticated endemic Brazilian species that produces desiccation-sensitive (DS) seeds, like over 36% of threatened plant species in the IUCN Red List. One of the causes of DS seed viability loss may derive from phosphatidic acid (PA) accumulation. This accumulation leads to leaky membranes, which intensifies seed leakage, and to increases in lipid peroxidation (MDA), which is also closely related to membrane disruption. We analyzed the ability of 1-butanol (1-BUT) and N-acylethanolamine (NAE), phosphatidic acid inhibitors, in improving seed germination upon desiccation. We imbibed *E. astringens* fresh seeds (1.02 g H₂O g DW⁻¹) for 24 h in distilled water (H₂O), 1-BUT or NAE and desiccated them to 0.25 g H₂O g DW⁻¹, then analyzed their germination, electrolytic leakage (EL) and MDA. Non-desiccated seeds germinated 100%. However, while H₂O- or 1-BUT-desiccated seeds kept viability around 55%, NAE-desiccated seeds presented 28% of germination, and non-imbibed (CNT) desiccated seeds decreased germination to 13%. Moreover, H₂O-, NAE- and 1-BUT-desiccated seeds displayed 2.6-fold less EL than CNT-desiccated seeds at 0.25 g H₂O g DW⁻¹. In relation to MDA, H₂O-desiccated seeds presented

44% less accumulation, while 1-BUT- and NAE-desiccated seeds presented 35 and 22% less accumulation than CNT-desiccated seeds, respectively. 1-BUT is known to inhibit PA formation and prevent its accumulation during unbalanced metabolism upon desiccation. Conversely, the mechanisms by which H₂O maintains seed viability are still unknown, but may be related to a stimulation on protein synthesis upon imbibition, which could improve survival rate during desiccation and promote germination. Our results indicate the possibility of reducing the DS behavior of *E. astringens* through a previous imbibition in either H₂O or 1-BUT, which increases germination capacity and reduces EL and MDA levels. This promising easy method can be used forward tropical species seed conservation strategies.