



PHYSIOLOGICAL CHARACTERISTICS UNDERPINNING SUCCESSFUL CRYOPRESERVATION OF THREATENED BROMELIACEAE SPECIES OF BRAZILIAN ATLANTIC FOREST

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Abstract: The germination requirements and the basis of the optimal water content before and after cryopreservation were studied for ten threatened Brazilian Bromeliaceae. Constant and alternating temperature regimes were used to determine the best conditions for seed germination. The relationship between seed water content (WC) and relative humidity (RH) was evaluated using water sorption isotherms. Seeds were cryostored at 3%, 5%, 7% and 9% WC and after 180, and 365 days of storage, and loss in viability and vigour were estimated. According to our findings, fresh seeds of all species showed maximum germination at temperatures between 20 and 30°C, indicating the absence of a physical/morphological dormancy. The sigmoidal relationship between seed water content and relative humidity was observed with no apparent differences in sorption characteristics among the species. The optimum water content for cryopreservation of most of these species was around 7%. Ultra-drying (3% seed wc) had a detrimental effect on seed viability and vigour. Our studies suggested orthodox storage behaviour for all Bromeliaceae examined since they are able to survive desiccation and freezing. This study has shown the feasibility of *ex situ* conservation in seed cryobanks of endangered bromeliads of the Brazilian Atlantic Forest to support future reintroduction of these species in nature.

Keywords: seed drying; orthodox storage behaviour; sorption isotherms; Ex situ seed banks