Effects of differential drying rates on viability retention of recalcitrant seeds of *Ekebergia capensis*

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Abstract

The drying rate of whole seeds of *Ekebergia capensis* (Meliaceae) was shown to influence the response to desiccation, with rapidly dried seeds surviving to lower water contents. Short-term rapid drying (to water contents higher than those leading to viability loss) actually increased the rate of germination. The form of the time course of decline of axis water content varied with drying rate; slow drying could be described by an exponential function, whereas with rapid drying initial water loss was faster than predicted by an exponential function. These observations suggest that slow drying brought about homogeneous dehydration and that the rapid drying was uneven across the tissue. This raised the possibility that the different responses to dehydration were a function of different distributions of water in the axis tissue under the two drying regimes. However, ultrastructural observations indicated that different deleterious processes may be occurring under the different drying treatments. It was tentatively concluded that a major cause of viability loss in slowly dried material was likely to be a consequence of aqueous-based processes leading to considerable membrane degradation. Uneven distribution of tissue water could not be rejected as a contributory cause of the survival of rapidly dried seeds to low bulk water contents. The differential response to dehydration at different drying rates implies that it is not possible to determine a 'critical water content' for viability loss by recalcitrant seeds.

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