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## Clarifying the Seed Storage Behaviour in the Miracle Plant *Synsepalum Dulcificum* (Schumach. & Thonn.) Daniell

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### Abstract

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Knowledge on seed storage behaviour is crucial for planning and implementing conservation strategies in plant species. In the miracle plant *Synsepalum dulcificum*, the only natural source of “miraculin” (a sweetening glycoprotein) but threatened shrub species, there was speculation indicating recalcitrance albeit sound evidence was lacking. In this study, we combined an experimental approach based on critical moisture content and storage environment analysis and a theoretical prediction model based on seed-coat ratio (SCR) and seed dry mass (SM) to clarify the seed storage behaviour in the species. Seed moisture content at shedding was determined and data on viability, germination and subsequent seedling vigour were collected after storage at different temperatures for various duration. We generated the probability of desiccation-sensitivity [P(D-S)] using the SCR and the SM from seeds collected from two provenances. Generalized linear models with binomial or Poisson error structures were used to analyse the effect of tested factors (Storage temperature and storage duration) on seed viability and germination in the species whereas an Analysis variance was employed to evaluate the effect of the same factors on the growth performance of seedlings. Our results indicated that seeds of *S. dulcificum* had an initial moisture content of 36.60 % with nearly 100 % viability. Seed dehydration below 20 % moisture content resulted in total loss of viability whereas low temperature storage is highly detrimental in the species seeds whose shelf life is a maximum of 21 days whatever the storage temperature. The SCR-SM model estimating the probability for dessication-sensitivity yielded 0.78 strongly supported experimental-approach findings. We also inferred that dehydration level, storage temperature and length highly affected subsequent germination speed and seedling vigour. Our findings are the first in their kind to set evidence of recalcitrance in *Synsepalum dulcificum* and serve handle-on information for designing sustainable conservation practices in the species.

**Keywords:** Dehydration, miracle berry, seed storage behaviour, seed vigour, seedling growth, storage environment

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