however, when non-dormant *S. alterniflora* seeds were dried, there was a burst in FOX-positive products between 80 and 60% WC (DWB). The FOX burst disappeared before the seeds reached their critical water content (40% WC), and does not appear to be related to recalcitrance. Organic and inorganic leachates were measured to estimate overall membrane damage. When whole *S. alterniflora* seeds were dried, neither organic nor inorganic leachates increased, suggesting that membranes are intact throughout the dry down. Protein carbonyl amounts were measured as an indicator of protein oxidation, and when *S. alterniflora* seeds were dried, carbonyl amounts increased significantly from 2.0 nmol mg^{-1} protein to over 5.0 nmol mg^{-1} protein. Protein carbonyl amounts did not increase significantly when *S. pectinata* seeds were dried; however, the baseline carbonyl amounts in *S. pectinata* were higher than the baseline in *S. alterniflora* seeds. The total antioxidant capacity also changed significantly when *S. alterniflora* seeds were dried, decreasing from 35% in fully hydrated seeds, to c. 12% in seeds with a water content <15%. The antioxidant capacity of *S. pectinata* did not change significantly during drying, yet the baseline antioxidant capacity was lower than that of *S. alterniflora* seeds. These results suggest that lipid peroxidation and membrane damage do not play a role in death due to drying, and without proper techniques, lipid peroxidation values may be falsely inflated. Protein oxidation and loss of antioxidant capacity may contribute to loss of viability as *S. alterniflora* seeds are dried.

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In vitro regeneration of recalcitrant embryonic axes: Effects on the biomass characteristics of resulting plants

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In vitro regeneration of the embryonic axes of recalcitrant seeds is a necessary step in practices such as cryopreservation of zygotic germplasm, micropropagation, and the production of disease-free plants. As recalcitrant seeds usually harbour surface and tissue-borne microflora, axes used for *in vitro* culture are invariably subjected to decontamination treatments such as surface-sterilisation with antiseptic substances, treatment with surface- and systemic fungicides and antibiotics, and culturing on variously-modified media formulations. The effects of these treatments are usually evaluated only on the basis of the level of decontamination achieved, with little information available on how these decontamination treatments affect the establishment and/or biomass characteristics of the plants subsequently produced. This study investigated the effects of different *in vitro* culture media, surface-steriliants, phenolic-controlling compounds, systemic fungicides and antibiotics on biomass accumulation and partitioning of seedlings obtained from embryonic axes of *Syzygium cordatum*, a recalcitrant-seeded multipurpose tree species indigenous to eastern and southern Africa. Embryonic axes were found to be infected with tissue-borne fungi at harvest, and any development after *in vitro* culture depended on decontamination. The decontamination treatments tested were most effective when axes were cultured on a medium containing MS nutrients. Even though the systemic fungicides tested (propamocarb-HCl, triazole and benzamidazole) and the antibiotic, kanamycin, were effective in curtailing the incidence of microbial infection, the axes treated with these compounds developed into stunted plantlets. The decontamination treatments, and the nutrient media on which the axes were originally cultured, also significantly affected the specific leaf area, leaf area ratio, leaf mass ratio, and unit leaf rate of seedlings assessed three months after *in vitro* culture. These results indicate that *in vitro* procedures applied to excised embryonic axes affect growth strategies and competitiveness of the plantlets produced. Future studies will seek to ascertain the basis of (particularly) the adverse effects of the fungicides used, and test alternative products having different active ingredients. (In this context, see current Abstract and Poster of Reddy et al.).

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Desiccation sensitivity in the Arecaceae: Correlates and frequency

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Many palm species are under threat of extinction. However, palms are under-represented in *ex situ* seed banks because of a lack of knowledge about their seed biology. To assess the conservation potential of palm seeds the *Semina Palmarum* project has been established to examine the desiccation tolerance of 200 species. A screening method using 100 seeds has been developed which quantifies seed water content, relative humidity, morphometry, initial germination percentage and rate, responses to short-term storage, desiccation tolerance and seedling morphology. The project has currently generated data for >150 species from c. 70 genera, many of which are new to seed conservation biology. Approximately a third of the species studied had desiccation tolerant seeds, which if extrapolated suggests routine *ex situ* conservation may be possible for c. 1000 species from this family. To enable predictions for seed responses to desiccation for previously unstudied species, here we explore, in a phylogenetic context, correlates of seed desiccation tolerance including germination morphology, seed mass and plant habitat.

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Desiccation tolerance is switched on and off in the resurrection fern, *Morhia caffrorum*