The reduction of seed-specific dehydrins reduces seed longevity in Arabidopsis thaliana

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Résumé en anglais	Dehydrins are late embryogenesis abundant (LEA) proteins that accumulate during seed maturation and in response to abiotic stresses in vegetative tissues. They are thought to protect cellular components from dehydration stress. However, whether they play a role in survival in the dry state is not clear. In this study, an RNA interference (RNAi)-construct against the seed-expressed dehydrin of Arabidopsis thaliana, LEA14 (At2g21490), was introduced to wild-type plants, which led to a strong reduction in transcript abundance of the target gene as well as that of two other seed-expressed dehydrin homologues, XERO1 (At3g50980) and RAB18 (responsive to abscisic acid 18, At5g66400) in the transformants. Mature, dry seeds from the RNAi plants germinated to at least 95% after rehydration, indicating that seed desiccation tolerance was not affected, while they exhibited a twofold reduction in longevity. When stored at 75% relative humidity and 35°C, the seeds of two independent RNAi lines lost 50% of their viability in 10 d and 5 d, respectively, while it took 17 d for wild-type seeds to lose 50% viability. In addition, when seeds were imbibed in the presence of 100 mM NaCl, the seeds of RNAi plants exhibited reduced germination compared to wild-type seeds, suggesting that at least one of the three seed-specific dehydrins plays a role both against deterioration during storage at low moisture content and when imbibed tissues are submitted to salt stress at high moisture.
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