Predicting the future germination performace of *Myracrodruon urundeuva* (Fr. All.) using thermal time and hydrotime model approaches

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Thermal time and hydrotime models evaluate seed germination across a range of temperatures and osmotic potentials and can be used to predict the effect of climate on seed germination. In this study, we used these models to quantify the thermal and hydro germination behaviour of *Myracrodruon urundeuva*, an endangered dry forest species, and to predict the effect of projected climate change scenarios on its germination performance and seedling development. Seeds of *M. urundeuva* were collected at different years (2010-2013) from the Brazilian biome *Caatinga* (W 040°07'13" S 8°36'55) characterised by a semi-arid hot climate and with some shallow salinized soils. Seeds were germinated across a range of temperatures (5 to 40 °C) and osmotic potentials (0 to -0.8MPa) created using polyethylene glycol (PEG) and NaCl. After 7 and 14 days from sowing, normal seedlings were accounted. Germination data were applied to thermal time and hydrotime models using repeated Probit analysis. Although air temperature might be higher than 34 °C until 2055 in a high CO_2 emission scenario, this may not inhibit seeds germination, which showed optimum temperature around 35 °C and maximum temperature higher than 40 °C. The minimum osmotic threshold for germination was lower in PEG (< -0.6MPa) than in NaCl (> -0.41 MPa), indicating NaCl toxicity in these seeds. This might compromise seed germination in future climates for the *Caatinga* biome since the annual rainfall is predicted to reduce by 20%, increasing the extent of soil salinization. Seedlings failed to develop at temperatures higher than 35 °C and osmotic potential lower than -0.4MPa (PEG solutions) and -0.36MPa (NaCl solutions). Although *M. urundeuva* seeds are likely to germinate in more pessimistic future scenarios, seedling recruitment might not happen in driest and hottest regions of Brazil, such as *Caatinga*. In those conditions, *M. urundeuva* natural regeneration, biodiversity and distribution throughout Brazil and may be compromised.

Towards a mechanistic understand of fire-driven recruitment in species with physiological dormancy: the role of heat shock, smoke, seasonal temperatures and seed age

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Dormancy and germination requirements determine the timing and magnitude of seedling emergence, with important consequences for seedling survival and growth. Physiological dormancy is the most widespread form of dormancy in flowering plants