



UMEÅ UNIVERSITET

STEERING ECOLOGICAL RESTORATION EFFORTS THROUGH THE STORM OF CLIMATE CHANGE

The case of tropical dry forest shrub species

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Akademisk avhandling

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Steering ecological restoration efforts through the storm of climate change: The case of tropical dry shrub species

Abstract

Climate change compels a reconsideration of prevailing ecological restoration paradigms and methodologies. The main goal of this thesis was to explore strategies to adapt the practices of ecological restoration to climate change. We studied the potential response of six Fabaceae shrub species from tropical dry forests, previously identified as potential candidates for ecological restoration, to anticipated climate change. We found Fabaceae woody shrub species germinated in a wide range of temperatures, light and darkness, and require mechanical scarification to break their physical dormancy. We combined modelling, laboratory, field and nursery experiments to unravel the potential response of *Mimosa luisana* to climate change. We found trait differentiation among the lower, central and upper population of the species current distribution range within the Tehuacán-Cuicatlán Valley (TCV), Mexico, but not local adaptation. The climatically suitable area of *M. luisana* is projected to expand, and experimentally, this species could tolerate a wide range of conditions in terms of temperature and soil moisture. Therefore, no need for assisted migration was found. Seed size differed among *M.luisana* populations, and showed a significant effect in early biomass production, but not in relative growth rate. This work has direct implications for restoration practices. First, because it addressed some of the challenges posed by climate change by highlighting methodologies that could be replicated for other species and ecosystems. Second, because it provides concrete guidelines for restoring ecological processes in tropical dry lands as the Tehuacán-Cuicatlán Valley, Mexico, that could be implemented by academics and local communities.

Keywords

Fabaceae shrub species, ecological restoration, climate change, *Mimosa* spp., assisted migration, center-periphery model, tropical dry forest.

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