

Post-fire regeneration across climate gradients

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Abstract

In flammable Mediterranean shrublands, plant species have evolved to persist with recurrent fire disturbance by germinating profusely after fire from long-lived seedbanks or resprouting from surviving dormant buds. The success of these strategies depends on how they cope with both fire and climate. Thus, we studied intraspecific variability in key post-fire regeneration mechanisms of five species, including heat-released physical seed dormancy and resprouting ability, along environmental gradients of summer temperatures and aridity in Eastern Spain. Our results demonstrate considerable among-population variability in both traits. Seeder populations growing under warmer summers require more heat to release seed dormancy, in order to maintain the soil seedbank during the inter-fire period. However, variability in resprouting ability was determined by a combination of factors that define individual plant history, and only secondarily by differences in water availability. Climate projections for the Mediterranean Basin predict rising temperatures and increasing frequency and intensity of heatwaves and droughts. Understanding the interaction between post-fire regeneration and climate is thus essential to predict future biodiversity of fire-prone ecosystems.

Keywords: fire, climate, variability, germination, resprouting

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