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Fitness benefits of fire-stimulated flowering in Mediterranean geophytes

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Abstract

Fire-stimulated flowering is a widely recognized strategy in fire-prone ecosystems, such as Mediterranean ecosystems. Species with this strategy flower more profusely in postfire conditions than in absence of fire. This strategy occurs specially in herbaceous plants, most of them geophytes that use stored reserves in the belowground organs for a quick post-fire bloom. However, little is known about the fitness benefits of this strategy. We studied geophytes in Southern Spain and compared flowering in recently-burned areas with flowering in adjacent unburned areas. We found that fire stimulated dormant belowground bud banks, increasing flowering density in burned areas. Individuals in the burned areas showed higher pollen deposition in their stigmas and higher reproductive success. Our findings suggest that fire-stimulated species, when they flower quickly after fire, can benefit at different stages of their reproductive cycle, from flowering initiation to seed production and recruitment.

Keywords: Fire ecology, geophyte, postfire flowering, pollen deposition, wildfire