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Short communication

Effect of heat and ash treatments on germination of Pinus pinaster and Cistus laurifolius

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Abstract

Two experiments were performed to study the effect of fire and ash concentration on the germination of Pinus pinaster and Cistus laurifolius seeds. These experiments combined seven different temperatures, ranging from 70 °C up to 190 °C, and two times of exposure, 1 and 5 min. In addition to these treatments, a control treatment was performed in the absence of thermal shock. Following the heat treatments, seeds were introduced into a germination chamber in a randomized design and under controlled conditions of temperature and photoperiod.

P. pinaster seeds responded positively in germination to thermal shocks of short duration (1 min) over the studied range of temperatures. Nevertheless, in the simulation of fires of long duration, temperatures equal to or higher than 130 °C, resulted in lethal effects on seeds. On the other hand, C. laurifolius seeds responded positively if the temperature was below 110 °C, independent of time of exposure. The effect of ash concentration was also tested but failed to produce significant differences in the germination rates of either species.

The results of this study suggest prescribed fire could be incorporated in sustainable forestry practices following detailed studies of its direct and indirect effects.

Keywords: Competition; Fire; Pine; Probability; Regeneration; Seed; Thermal shocks

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