Effects of fire Products on the Seed Germination of the Three Dominant Species from Astragalus Genus in Semi-Steppe Rangelands of Central Zagros, Iran

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Abstract

Fire products (smoke, ash and heat) have widely been recognized as a germination cue for some species from both fire prone and fire-free ecosystems. It is an important factor for the understanding of vegetation dynamics and could have potential use for ecological management and rehabilitation of disturbed area. This study attempts to understand the effect of the main fire products (smoke, ash and heat) on germination of the three dominant species in the semi-arid rangelands of Feridan in Isfahan province including: *Astragalus adscendens*, *Astragalus susianus* and *Astragalus verus*. Six treatments including: 3 of heat (60°C, 80°C and 120°C), 1 of smoke, 1 of Ash, and 1 of control were tested in the current study. Results showed that the seeds were incubated in a germination chamber with a photoperiod of 12 h of light at 22.5°C and 12 h of darkness at 17.5°C. The three studied species had different responses against the used fire factors. Smoke and ash treatments did not modify the germination percentage of *A. adscendens*, but its germination was increased and significantly decreased in low heat (60°C) and severe heat (80 and 120°C) respectively. Germination percentage of *A. verus* was increased after the smoke treatment compared to the control treatment, but it did not increase the germination of *A. susianus*. Outcomes of further research would have important impacts also for conservation, environment management and ecosystem restoration in semi-arid rangelands.

Keywords: Smoke, Ash, Heat, Vegetation dynamics, Seed dormancy, Astragalus.

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