

Effects of burning on grassland vegetation cover on the northeastern side of the Alborz ranges in Iran

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Introduction Golestan National Park is located on the northeastern side of the Alborz ranges, Golestan province, Iran. Because of the special vegetation cover and being located close to two wet and dry weather areas, this park is vulnerable to fire hazards. Between 1957 and 2004 more than 67 fires have been reported in the park. The international importance of the park requires a careful study on fire effects on vegetation cover, phytomass production, grass diversity and successional process after fires.

Materials and methods The measurements were recorded in the Takhti Yeylagh grassland site in Golestan National Park. The site had experienced an accidental fire in 1995, which burned more than 720 ha. One area each of burned and unburned (control) were identified and separated on 1/50,000-scaled topography maps and 1/20,000-scaled aerial photos. Vegetation types in both control and burned areas were identified on similarity in soil and topography. In each site 36 samples were taken by stratified randomisation. A double sampling method of transects and quadrats was employed to identify the vegetation types and species frequency in each site (control and burned). The Shannon Index was used to evaluate species diversity in control and burned sites.

Results The percent vegetation cover of annual and perennial grasses in both control and burned sites significantly ($P < 0.05$) increased after fire (Table 1). The results correspond to reports by Engle, *et al* (1998) and Decastro & Kauffman (1998). However, the vegetation cover of forbs significantly decreased in burned areas. The total vegetation cover in burned sites significantly increased compared to the control (Table 1). No species diversity differences were observed within five years after the fire between control and burned sites (Shannon index 0.95 and 1.02). These results are in contrast with Fensham's (1999), who reported a significant difference in tropical Eucalyptus forest ten years after fire in Australia.

Table 1 Vegetation cover of plants in control and burned sites in Golestan National Park five years after fire

Vegetation type	Vegetation cover percent (Burned site)	Vegetation cover percent (Control site)
Annual and biennial grasses	56.9a	21.2c
Perennial grasses	4.7e	12d
Forbs	3.4e	30.6b

Means with the same letter are not significantly different at 5% level

Conclusions The reduction in perennial grasses and significant increase in annual grasses (secondary species) in burned site compared to control indicates a preventing effect of fire on positive succession towards climax. The increment of grasses after each fire makes the range ecosystem in Golestan National Park more vulnerable to fires because of huge leaf senescence, especially in annuals.

References

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