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Comparison of vegetation composition under different grazing intensities in Golestan National Park and vicinities , Iran

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Key words : canopy cover , forage production , grazing , sheep , gazelle , protected areas

Introduction A lack of understanding concerning rangeland carrying capacities in the Middle East is a major problem leading to rangeland degradation . The primary objective of this research is to determine the effects of excluding sheep and gazelle on vegetative canopy cover and species composition .

Materials and methods To compare vegetation composition with different levels of grazing we used three sites : 1) livestock exclusion and limited gazelle grazing (Mirzabylou plain) , 2) moderate sheep grazing (Ghorkhoud Protected Area) , and 3) heavy sheep grazing (Spakhou village grazing unit) . Random 1-m² plots were established at systematic distances radiate from water points/ villages . The number of plots varied from 30 to 50 depending on the area of each site . Dry matter biomass within each life form (grass , forb , and shrub) and canopy cover by species were recorded .

Results The results showed that in Mirzabylou plain with 440 kg/ha dry matter , shrub and forb increased with distance from water . Based on observations were made around water points , the gazelles usually preferred browsing shrubs . In the Ghorkhoud protected area which is moderately grazed based on permits , we estimated 320 kg/ha dry matter . As we move from uplands to low lands near main road , forbs decreased and shrubs increased . The forbs were present and grazing had a uniform distribution . In the vicinity of Spakhou village , the above ground biomass is about 188 kg/ha dry matter . The forbs and grasses grazed to the surface , shrubs were abundant (Figure 1 and Table 1) .

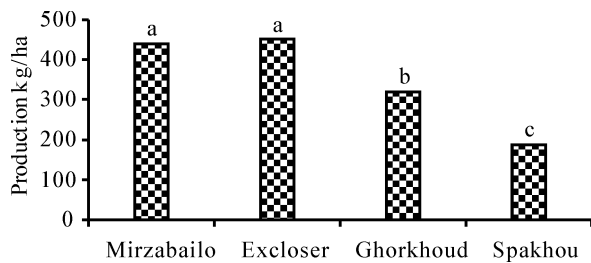


Table 1 Canopy cover of different life forms under four grazing intensities .

Life form	Canopy cover (percent)			
	Mirzabailou	Exclosure	Ghorkhoud	Spakhou
Shrub	15 .0 ^a	20 .0 ^a	10 .0 ^{ab}	16 .0 ^b
Forb	4 .7 ^a	5 .0 ^a	7 .8 ^b	4 .0 ^a
Grass	14 .0 ^a	14 .5 ^a	9 .0 ^b	1 .5 ^c

Figure 1 Biomass under four intensity of grazing intensities . Based on our estimates , this range can carry 225 sheep and goats , but is currently grazed 5380 AU . We estimate the carrying capacity of Ghorkhoud rangeland at 457 AU which is equivalent to the permits issued by the National Range and Forest Organization . As far as the Mirzabylou range unit is protected from sheep and goat grazing and the numbers of gazelles are 184 which are below the carrying capacity and could be increased to 650 gazelles .

Conclusions In our study wild ungulates like gazelle appear to have little impact on vegetation , but large numbers of domestic livestock have lead to overgrazed conditions .

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