

## Effects of grazing on AM colonization and spore density in arid grasslands of Loess Plateau

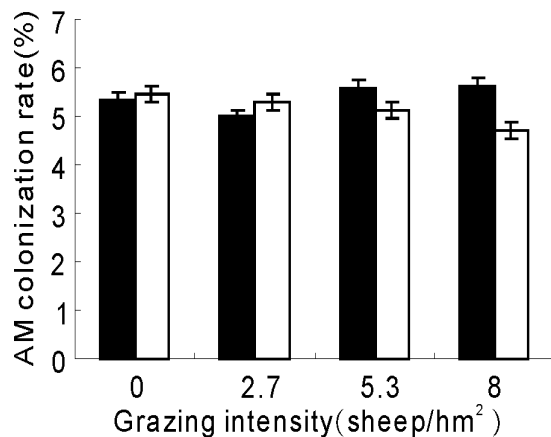
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**Key words :** arbuscular mycorrhizal fungi , herbivores , Loess Plateau

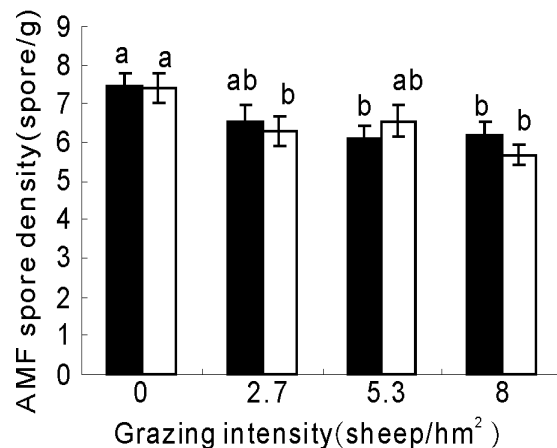
**Introduction** Arbuscular mycorrhizal fungi (AMF) form symbioses with the roots of the majority of terrestrial plant species . These associations are generally considered mutualistic to both plants and fungi . However , few studies focused on the relationships among AMF , plants , and herbivores . The objective of this study was to investigate the effects of grazing on AM in arid grasslands of the Loess Plateau .

**Materials and methods** This study was conducted in Huanxian Ecological Research Area of Lanzhou University (N37°12' , E106° 82' ) , located in Loess Plateau , Gansu Province , China . Four grazing intensity plots ( 0 , 2.7 , 5.3 and 8.0 sheep hm<sup>2</sup> ) were designed in 2002 . Every plot area is 5000 m<sup>2</sup> with 3 replicates . *Stipabungeana* and *Artemisiacapillaries* are the two dominant species in the grassland . The roots and rhizosphere soil from *S . bungeana* and *A . capillaries* with 20 replicates were randomly collected in every plot for determining AM colonization rates and spore densities in 2006 . Data were analysed using One-way ANOVA with SPSS (v13 .0) .

**Results** Our results showed that there were no significant difference (  $P > 0.05$  ) in AM colonization rates of *S bungeana* and *A capillaries* for four grazing intensities ( Figure 1 ) . AM colonization rates in the roots of *S bungeana* are higher in 5.3 and 8.0 sheep hm<sup>2</sup> treatments than CK . However , the rates of AM colonization of *A . capillaries* decreased while the grazing intensity increased . AMF spore densities in rhizosphere soil of *S . bungeana* and *A . capillaries* under four grazing intensities significantly decreased (  $P < 0.05$  ) as grazing intensity increased ( Figure 2 ) .



**Figure 1** AMF spore density in the rhizosphere soil of *S . bungeana* and *A . capillaries* under four grazing .



**Figure 2** AMF colonization rate in roots of *S . bungeana* and *A . capillaries* under four grazing .

Note : The black bar shows the results of *S . bungeana* and the white bar shows the results of *A . capillaries* in Figure 1 and Figure 2 .

**Discussion** Our results showed that herbivores can regulate AMF colonization rates in various plants with different strategies . Aboveground consumers may reduce photosynthate translocated to the root system and available to mycorrhizal fungi , resulting in a reduction in AMF spore density in rhizosphere soil . In general , the grazing can result in a negative relationship with AMF sporeproduction .

**Acknowledgement** This study was funded by National Basic Research Program of China (2007CB106804) and Natural Science and Technology Program of Lanzhou University (582402 , 582403) .