

Artemisia sphaerocephala may enrich the soil microbial communityC. C. Baskin^{3,4}, J. M. Baskin³, W. H. Zhang¹ and Z. Y. Huang^{1*}¹Laboratory of Vegetation and Environmental Change, Institute of Botany, Chinese Academy of Sciences, Beijing 100093, China;²Research Center, Beijing Academy of Agricultural and Forestry Sciences, Beijing 100097, China;³Department of Biology, University of Kentucky, Lexington, Kentucky 40506, USA;⁴Department of Plant and Soil Sciences, University of Kentucky, Lexington, Kentucky 40546, USA.

Many desert plants is one of the evolutionary adaptations of plants to desert. Seed mucilage is an important functional trait that provides many ecological benefits (Zhang *et al.* 2012). Previous studies on the function of mucilage have mainly focused on dispersal strategy or seed germination. The objectives of the present study were to investigate the effect of mucilage on soil microbes.

Each achene was placed in 250 ml glass flasks. Dry mucilage (2 mg) of *Artemisia sphaerocephala* was added to each bottle and mixed thoroughly into the soil. A soil without mucilage (S), a sterilized soil (previously heated to 121°C for 240 min) and a sterilized soil with mucilage (St + M) were also included. Viable microbial biomass during mucilage degradation was measured using the PLFA technique (Zak *et al.* 2003) every 1 d.

Conclusions

Microbial biomass in S + M increased with incubation time, and significantly exceeded that in the other treatments ($P < 0.05$). Microbial biomass in S was lower than that in S + M and remained constant during incubation ($P < 0.05$). However, microbial biomass in St + M and St decreased during incubation ($P > 0.05$; Figure 1a). The discriminant analysis (DA) performed on the data set of PLFA showed a clear classification of samples in terms of culture treatments, with more than 66% of samples correctly classified (Figure 1b). Thus, mucilage had a significant effect on microbial community. The presence of mucilage may enrich the soil microbial community.

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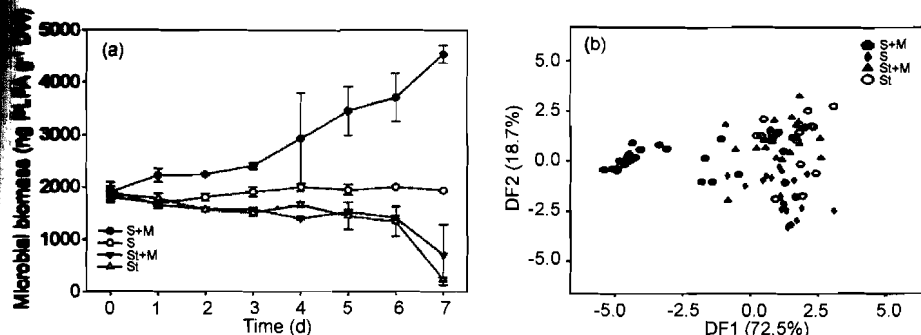


Fig. 1. Microbial biomass (a) and discriminant analysis for each treatment (b) during degradation of *Artemisia sphaerocephala* achene mucilage in soil. St, sterilized soil without mucilage addition; S, soil without mucilage addition; St + M, sterilized soil with mucilage addition; S + M, soil with mucilage addition. Microbial biomass is mean \pm SE of three samples.

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