

Artificial reseeded promotes biodiversity restoration in alpine sandy meadow of the eastern Qinghai-Tibet Plateau

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Abstract

Alpine grasslands have undergone severe desertification due to climate warming and overgrazing. Artificial reseeded has been widely employed for the restoration of these alpine sandy grasslands. However, its effectiveness in enhancing biodiversity, as well as the consistency of responses in aboveground plant diversity and belowground microbial diversity, remains unclear. To investigate the impacts of artificial reseeded on plant and microbial diversity of sandy meadows, we conducted field investigations in alpine grasslands of the eastern Tibetan Plateau that had undergone artificial reseeded, natural restoration, or remained as sandy meadows. The findings revealed that artificial reseeded yields inconsistent restoration outcomes for aboveground plant diversity and belowground soil microbial diversity in alpine sandy meadows, thereby altering the relationship between above- and belowground biodiversity. Artificial reseeded significantly promoted plant diversity in alpine sandy meadows, while its impact on restoring soil microbial diversity was less pronounced. Introducing new plant species through reseeded improved vegetation cover, plant diversity, and fungal richness. In addition, artificial reseeded altered soil properties, such as pH and nutrient content, which in turn influenced the composition and structure of plant and microbial communities. These results have essential implications for regional ecological security and the sustainable development of alpine meadows.

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