Impacts of Long-Term Enclosure on Soil Microbes in Mountain-Pasture in Bayinbuluke

Ping'an Jiang

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JIANG Ping-an
Phone :13079998356 , E-mail :jiang863863@ sina .com

Key words : Bayinbuluke , enclosure , soil microbes , subalpine grassland , subalpine meadow steppe , subalpine steppe meadow

Introduction Biomass of microbes functions to store and regulate release of plant nutrients and is an important component of soil fertility . Presently , research on soil microbes focuses mostly on morphology , physiology , conversion of substances , and the impact of root system on development and activity of microbes etc . but little about research has been conducted on grasslands .

Xinjiang is an important province of animal husbandry and Bayinbuluke is the secondary biggest pasture area in China . The unbalance between grass availability and animal requirements leads to the increasing degradation of grassland and endangers animal husbandry . Enclosure favors the restoration of grassland vegetation , promotes soil microbes , and increases soil fertility and protects against desertification .

Materials and methods Subalpine grassland , subalpine meadow steppe and subalpine steppe meadow of 25-year enclosure life in Bayinbuluke were selected . Sampling points were selected at random inside and outside each sample area with a sampling depth of 60cm and an interlayer-space of 5cm . The soil microbes were analyzed with the dilution plate method .

Results and analysis

Impact of enclosure on soil microbe population Bacteria in soil microbe samples inside and outside enclosures in those three grassland types exceeds 50% of gross .Bacteria , ctinomyces and fungi in soil microbe inside enclosures in subalpine grassland and subalpine meadow steppe exceeds that outside due to higher moisture and nutrient contents than that outside ; but it is opposite in subalpine steppe meadow due to higher moisture and nutrient contents outside than that inside . Bacteria , ctinomyces and fungi in those three grassland types are of obvious surface accumulation .

Impact of enclosure on total soil microbes With little interference from the outside in the long-term enclosure , neither eating nor trampling , the total microbe count inside enclosures of subalpine grassland and subalpine meadow steppe is statistically higher than outside . The enclosures of 1～5 years are not significantly different between inside and outside , which was reported by Li Hui et al . , and demonstrates that the enclosure time decides the difference in soil microbe count inside and outside the enclosure .

Conclusions For vertical distribution of soil microbes , the three grassland types studied have most soil microbes in the top soil layer , showing a surface accumulation feature ; soil microbes between 0～60cm decreases with depth ;
For the impact of enclosure on total soil microbes , microbe counts inside the enclosure of subalpine grassland and subalpine meadow steppe is much higher than outside ; but total soil microbe inside of enclosure of subalpine steppe meadow is lower than outside .

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