Ecology, physiology and behaviour

Grazing reduced vegetation biomass and root nutrition related to plateau zokor creating mounds in summer on the Tibetan Plateau

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Plateau zokor (*Eospalax baileyi*) is an endemic, subterranean rodent native to the Tibetan Plateau. Its burrowing activity results in numerous bare mounds on the ground. These mounds interfere with plant community succession, affect carbon sequestration, reduce grazing areas, and intensify soil erosion, thus serving as key visual indicators of the zokor's ecological disturbances. Conventional views suggest that zokors primarily dig tunnels and then create mounds for mating and food storage in spring and autumn, respectively. Consequently, former studies have focused on mound creations only during these two periods. However, we found that plateau zokors also create mounds during the summer in the summer pastures. We designed experiments to investigate the environmental variables associated with this summer mound-creating phenomenon, and the results indicate that this behaviour is closely related to reduced vegetation biomass and nutrition in summer pastures. We further assessed the nutrition of plants and discovered that increasing mounding activity by zokors in summer corresponds with a decline in plant root quality, including reductions in crude protein, fats, and sugars, as well as fiber contents. Utilizing a random forest model, we found that the decrease in crude protein in plant roots is the principal factor influencing zokor mound creation in summer. These findings offer important insights for developing adaptive management strategies for alpine grasslands and assessing the environmental impact of the plateau zokor in alignment with the different grazing regimes.