

章异平,江源,刘全儒,任斐鹏.放牧对五台山高山、亚高山草甸牧草品质的影响.生态学报,2011,31(13):3659~3667

放牧对五台山高山、亚高山草甸牧草品质的影响

Impacts of grazing on herbage quality of the alpine and subalpine meadows within Wutai Mountain

投稿时间: 2010-10-9 最后修改时间: 2011-4-7

DOI:

中文关键词: [五台山](#) [放牧](#) [牧草品质](#) [营养成分](#) [适口性](#) [高山和亚高山草甸](#)

English Keywords: [Wutai Mountain](#) [grazing](#) [herbage quality](#) [nutrient composition](#) [palatability](#) [alpine and subalpine meadow](#)

基金项目: 国家自然科学基金资助项目(40871055,40571001)

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中文摘要:

通过野外样地调查和室内分析,从牧草的适口性和营养成分两方面,研究了放牧对五台山高山、亚高山草甸牧草品质的影响。结果表明:放牧干扰草甸中适口性为喜食及以上的优质牧草种类为20种,喜食牧草在群落中的相对盖度最大,为45.40%;与之相比,极度退化草甸中优质牧草种类为13种,乐食牧草的相对盖度最大,为62.24%;喜食以上优质牧草的相对盖度最大值,出现在轻度退化草甸中,达到65.95%。同一适口性等级牧草,在不同退化等级草甸中,种类发生变化。从放牧干扰草甸到极度退化草甸,牧草中的粗蛋白和灰分含量呈增加趋势,而中性洗涤纤维和酸性洗涤纤维含量呈下降趋势。放牧压力下,五台山高山、亚高山草甸的牧草品质并未下降,但放牧造成的草甸生产力降低,制约了资源的可持续利用和保护。

English Summary:

The subalpine and alpine meadow vegetation in Wutai Mountain, North China, distributed in altitude from about 2400 m a.s.l. through to 3061 m a.s.l. at the summit, serves as the largest summer mountainous pasture for cattle grazing around the local area. However, the degradation with different grades owing to overgrazing occurred in the meadow has been observed in both vegetation and soil. Referring to features of vegetation, five grades of meadow degradation relating to different grazing pressure have been recognized in the area through our earlier studies.

This paper, based on the analysis in nutrient composition and palatability of herbage, aimed to determine the effects of grazing intensity on herbage quality of the subalpine and alpine meadow vegetation within Wutai Mountain. In total 85 quadrat (sized in 1m×1 m) data sampled during the field survey in 2006 were involved in the analysis.

The results showed that: (1) According to animals' grazing behavior, the grass species in meadows were grouped into six herbage grades in eating-palatability as, addicted-to, delighted-in, happy-to, just-pick-at, little to and never-touch. In the meadows under conventional interference of grazing, the most palatable herbage (species in the addicted-to and the delighted-to groups) reached 20 species, while in the extremely degraded meadows, those species appeared only down to 13. Also, according to the relative cover of a meadow community, which was classified into five grades in light of meadow degradation owing to grazing, the highest relative average cover emerged at meadows under conventional interference was held by the herbage group of delighted-in eating, reaching up to 45.40%, whereas the highest relative average cover in the extremely degraded meadows went to the herbage group of happy-to eating, as 62.24%. The highest relative average cover composed by herbage groups of happy-to eating and over appeared in the light degraded meadows, accounting to 65.95%. (2) The herbage species in the same palatable level changed in different grades of degraded meadows. For example, in the meadows under conventional interference that were graded at most favorable for cattle grazing, the species composition consisted mainly of *Festuca rubra*, *Kobresia pygmaea* and *Libanotis condensate*, whereas in contrast those most unfavorable for cattle grazing due to overgrazing in the past, the extremely degraded meadows, consisted mainly of *Carum carvi*, *Koeleria cristata* and *Polygonum aviculare*, regarded as unpalatable species. (3) The heavily-intensified grazing increased the contents of crude protein and ash in herbage, but decreased the neutral detergent fiber and acid detergent fiber. Although the herbage quality as referring to its biochemical composition was not much changed or even improved when grazing pressure was intensified, the quantity of herbage available for cattle grazing was decreased, which much reduced the economic gains and even may confine the sustainable use and natural conservation of meadow resources.

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