Assessment of Biomass Production on Pastoral Meadows in the Gutai Mountains

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Bulletin UASVM series Agriculture 76(2) / 2019

Print ISSN 1843-5246; Electronic ISSN 1843-5386

DOI:10.15835/buasvmcn-agr: 2019.0011

Abstract

The mountains meadows plays a significant role in biodiversity and ecosystem functions. In the present study biomass productivity were examined in natural mountain grassland in the region Gutai Mountains. The studied zone is being exploited by sheep and goat breeders. The determination of green mass production was established for an average of 11.6 t/ha m.v. and refusals represented 6.15 t/ha m.v. By empirical calculations we established the consumable production of 5.54 t/ha. These values of biomass production can be explained by the continuous exploitation of the pastoral resources, which affects the biodiversity. Overgrazing leads to the grassland degradation as a result of inadequate management of natural resources and, consequently, the decrease of pastoral value in the region.

Keywords: biomass, meadows, pastoral

Introduction

The meadows in the Gutai Mountains contain species of plants that are important for fodder, being an integrated part of the pastoral system in the region. However, it is essential to establish a system of the resource assessment, because, in recent years, there have been pressures due to the climate change which affects the species composition, their diversity, and biomass production (Pacurar *et al.*, 2014).

In addition to its role as a basic nutrient for wild and domestic animals grazing in the area, grasslands have opportunities for an adding value by exploiting positive health characteristics in animal products from grassland and through the delivery of environmental benefits (Charlier *et al.*, 2009).

The assessment of the biomass production on the mountain pasture is of particular importance, both for exploiting the potential of this cheap

forage resource and for preserving their multifunctionality. The pastoral heritage includes protecting the biodiversity of the grasslands and maintaining the function of the grazing ecosystems in the Gutai Mountains region.

Materials and methods

This study was carried out on the mountain pasture of the Gutai Mountains at an altitude of 1030-1150 m, where seasonal herds of sheep and goats are grazed.

The measurements were performed during three years, in summer time. Plant biomass was determined by the gravimetric method, after repeated mowings of 1 m several times (Fig. 1).

Results and Discussion

The floral composition has shown that the pasture is characterized by an average level of pastoral flora diversity; those herb communities

Figure 1. Aspects of the experimental field

mainly belong to *Viola declinatae* *Nardetum*. The biomass production was calculated as a result of the repeat of repeated mowing operations and the weighing of the vegetal mass that was harvested from several points. Calculating the average of these weights and extrapolating the value obtained per hectare resulted the overall biomass production on the pastoral pasture of 11.6 t/ha m.v.

Mowing and weighing of the refuse of the non-consumed plant residues were carried out each year at the end of the grazing period, leading to the value of 6.15 t/ha m.v. As a result of the obtained results, it was possible to establish the consumable pasture production as 5.45 t/ha m.v.

These values indicate the frequent use of meadows during summer, which shows that strict a grassland management is required to control the provision of ecosystem services. This has been underlined in other studies on mountain grazing lands, where there was a negative correlation between the grazing intensity and the richness of the plant species (Schneider *et al.* 2013).

Conclusion

Our results show a drop in the consumable biomass due to the grazing animals in the area, thus the local animal breeders should adopt an appropriate plan to allow the regeneration of pastoral meadows in the Gutai Mountains. Monitoring the annual changes in the biomass production of grass in the mountain ecosystems helps to rebalance the soil-plant-animal relationship.

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