

CHANGES IN DENSITY OF ARTEMISIA DIFFUSA UNDER THE DIFFERENT SHEEP GRAZING INTENSITIES

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Abstract: *this study examined the effects of varying sheep grazing intensities on the density of Artemisia diffusa, a dominant semi shrub species in many rangeland ecosystems. Four grazing intensity treatments (initial grazing, low grazing, medium grazing, and high grazing) were established in replicated plots over a two-year period.*

Key words: Karnabchul semi-desert, rangeland, grazing, *Artemisia diffusa*

Introduction: grazing is a prevalent land use practice worldwide, especially in grazing and rangelands (O'Mara et al. 2012). The intensity of grazing, characterized by factors such as stocking rates, duration of grazing, and frequency of grazing, can significantly influence the structure and composition of plant communities (Yusupov et al. 2003). Overgrazing, in particular, has been identified as a major threat to the health and sustainability of rangeland ecosystems (Rajabov et al. 2020). It can lead to soil erosion, loss of plant diversity, and degradation of overall ecosystem services (Gao et al. 2020).

In Uzbekistan, the scale of the areas in degradation due to continuous of livestock grazing in the rangelands of the desert and semi-desert regions is increasing sharply (Rakhimova 2019; Rajabov et al. 2020). As a result, the natural vegetation cover and its structural structure of 50-70 percent of rangelands in arid regions have been significantly transformed (Gintzburger et al. 2003).

While several studies have examined the effects of grazing on *Artemisia diffusa*, there is still a need for more comprehensive research to understand the long-term impacts, interactions with other biotic and abiotic factors, and potential adaptive strategies of this species under varying grazing intensities (Zhao et al. 2005; Rajabov et al., 2021). But, understanding the relationship between sheep grazing intensities and the density of *Artemisia diffusa* is essential for effective rangeland management and conservation strategies. Such knowledge can guide land managers, and livestock producers in

making informed decisions that promote sustainable grazing practices while preserving the ecological integrity and biodiversity of rangeland ecosystems.

The purpose of this research work is to determine the density indicators of *Artemisia diffusa* in the case of Karnabchul semi-desert rangelands located in the south-western part of Uzbekistan at different sheep grazing intensities.

Research methods: The region of Karnabchul semi-desert, where the research was conducted, covers an area of approximately 500 thousand hectares (Fig.1). The climate is sharply continental and dry, with an average annual temperature of 16.8°C and an average annual precipitation of 182.6 mm (Fig.2)

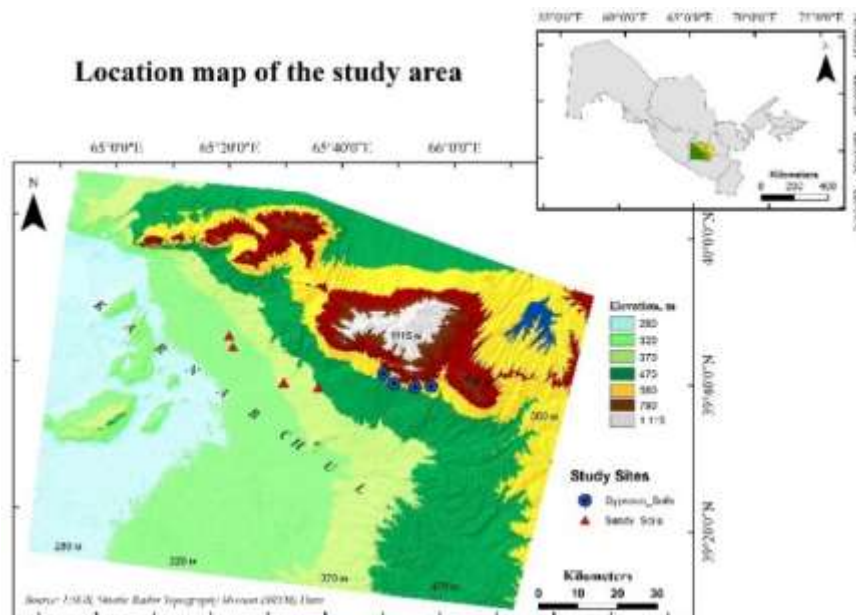


Figure 1. Location and elevation indicators of study sites of Karnabchul semi-desert of Uzbekistan.

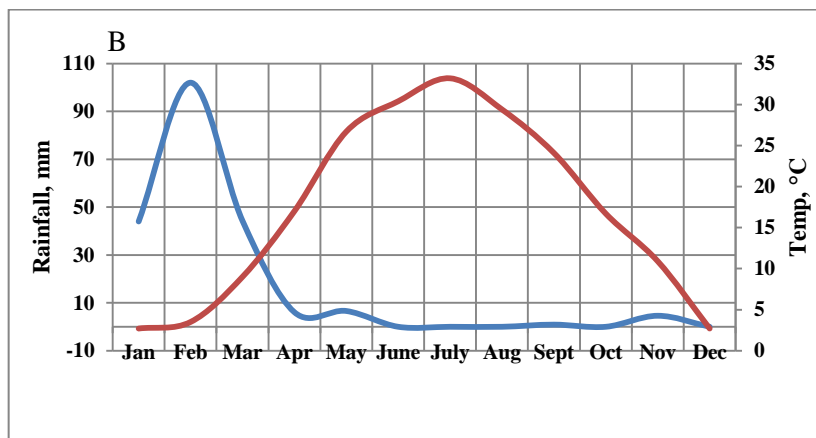


Figure 2. rainfall and temperature of the studied area, the blue line is rainfall, and the orange line is temperature.

Density results obtained during the research were analyzed according to the above 4 sheep grazing intensities. The density of *Artemisia diffusa* was determined using the generally accepted transect method. Depending on the condition of the rangelands, 25x2 m transect ropes were used and performed in three replicates for each research area. The number of *Artemisia diffusa* per hectare that fit the transect ropes was counted.

Results discussion: A significant decrease in the density of *Artemisia diffusa* due to the increase in the intensity of sheep grazing was revealed during our research. A relatively high density of *Artemisia diffusa* was observed in rangelands with initial and low sheep grazing intensities (Fig.3).

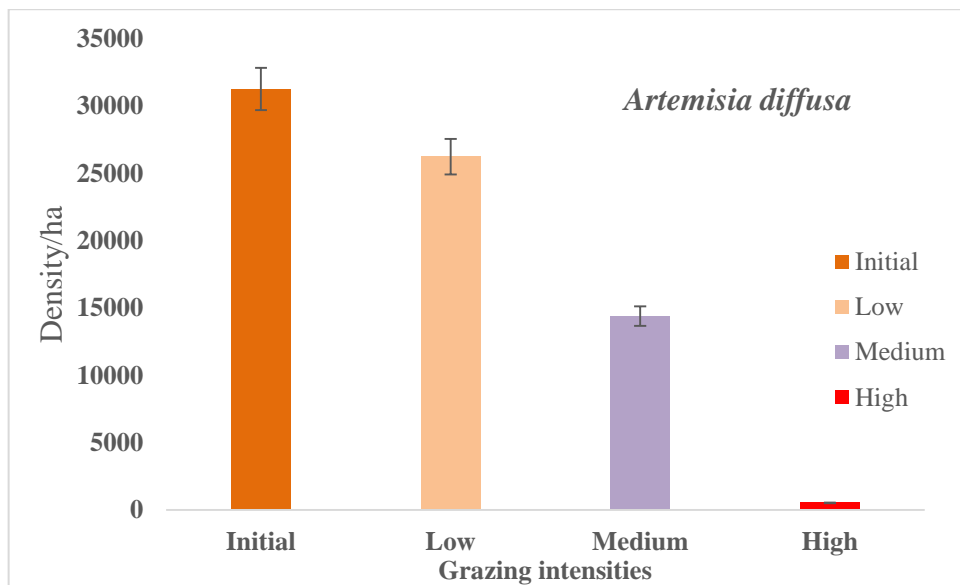


Figure-3. Density of *Artemisia diffusa* at different sheep grazing intensities

The density of semi shrubs of *Artemisia diffusa* was 31266 per hectare in the rangelands under the influence of initial grazing intensities. The highest significant effect of grazing intensities was observed in pastures with high grazing intensities, and the density of semi shrub of local *Artemisia diffusa* was significantly reduced to 514 semi shrub per hectare.

It was observed that *Artemisia diffusa* had a significant effect on the indicators of the density of bushes at the medium sheep grazing intensities, which decreased to 14,400 per hectare. The decrease in the density of semi shrub according to the level of grazing was on average 25%.

The results of the research revealed that, the effect of sheep grazing on *Artemisia diffusa* density would depend on the specific conditions of the grazing regime, the resilience of the plant, and the interactions with other biotic and abiotic factors in the ecosystem. Proper management of grazing

practices is essential to maintain the ecological balance and ensure the sustainability of *Artemisia diffusa* populations.

Conclusions: in conclusion, the density of *Artemisia diffusa* was significantly affected by the intensity of sheep grazing, with higher levels generally resulting in lower densities. It underscores the importance of sustainable grazing practices that consider the ecological needs of native vegetation to ensure the long-term health and productivity of grazing lands.

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