



CHANGES IN THE TRANSPIRATION PROPERTIES OF *Artemisia diffusa* UNDER THE INFLUENCE OF DIFFERENT LIVESTOCK GRAZING

(in the case of Karnobchul desert)

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Abstract

In the article, natural *Artemisia diffusa* water regime transpiration characteristics changes were studied. It has been found that transpiration characteristics of *A. diffusa* also increase with increasing levels of grazing stress.

Keywords: rangeland degradation levels, grazing level, transpiration, desertification

Introduction

Among the natural ecosystems of Uzbekistan natural rangelands are considered important [1]. In recent years, overgrazing of livestock in natural rangelands has been damaging the structure and functions of the ecosystem of rangelands along with a constant decrease in the productivity of plant cover [2, 3]. As a result of irregular use of rangelands and regular of livestock grazing, it has become a degradation [2]. Dramatic changes in the vegetation cover of desert rangelands can be seen in the increase of less edible, harmful invaziv species in these areas [4, 5]. This, together with the decrease in productivity of rangelands, leads to a sharp reduction of natural vegetation, which is well eaten by livestock grazing, and to the increase of desertification processes due to the violation of water regime characteristics [5, 6]. Given the current situation caused by unsystematic and unregulated grazing, this problem is one of the most pressing problems today [7, 8, 9]. For this reason, currently, much attention is being paid to research related to livestock grazing and its





consequences [1, 3]. Such developments are not only of scientific, but also of great practical importance. By knowing the development trends of rangeland plants and their resistance to external influences, it is possible to regulate overgrazing and thereby maintain pasture ecosystems in a highly productive state [9, 10].

Materials and Methods

The research was conducted in the spring season of 2020-2022 in Nurabad district of Samarkand region. The climate of Karnabchul desert, like all the deserts of Central Asia, is dry and sharply continental [3]. For many years, the average annual air temperature is +17.1°C. The hottest air temperature is observed in June-July and is 40-47 °C. The coldest temperatures are observed in December-February, sometimes reaching minus 20-30°C. 8 areas were selected for our research. According to soil conditions, 4 gypseous 4 sandy soils were subjected to grazing stress level (initial, low, medium, high) . In the selected areas, research was conducted during the period of physiologically active biomass accumulation (leafing) of *A. diffusa* plants. In the study of the water regime of plants, L.A. Ivanov and others [4, 5, 6]. It was done using L.S Litvinov methods.

Results

Changes in the transpiration rate of any level of transpiration in gypseous rangelands were different daily, and the rate of transpiration increased with the increase of the transpiration level.

It is necessary to apply a system that saves ecologists by limiting the water consumption of plants for transpiration. First of all, it should be related to a sharp decrease in moisture management in the root layers of the soil. At the initial and lower levels of grazing, control was observed from 516.4 mg/l to 533.4 mg/h at 8⁰⁰ a.m. in the early part of the day fig 1.

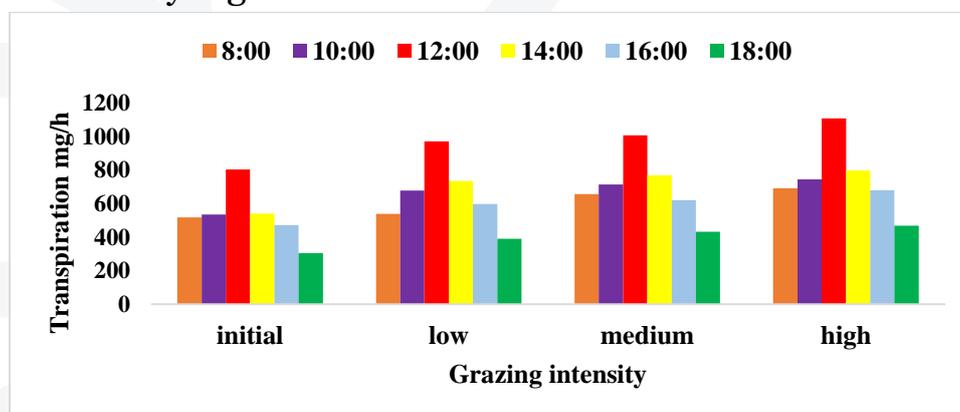


Figure 1. Daily transpiration parameters of *A. diffusa* in gypseous rangelands.



At 10⁰⁰ a.m., the result started to increase slightly, changing to 550.1 mg/h at the fed level and increasing to 585.6 mg/h at the low level. By mid-day at 12⁰⁰ p.m., the peak retention rate was 853.7 mg/hour. With the highest peak retention at 801.5 mg/h at both baseline and low levels.

By the second half of the day, the transpiration index slightly decreased in early and low feeding and reached 538.9 mg/h and 602.4 mg/h. In the next part of the day, at 16⁰⁰ and 18⁰⁰, it showed its lowest indicator in both maintenance levels. At the initial level of grazing, 471.4 mg/h was observed, and in the last part of the day (18⁰⁰), it decreased to 303.3 mg/h.

It was observed that during the middle and upper stages of grazing, the daily transpiration rates were significantly different compared to the initial and middle levels of grazing. In the early part of the day at 8⁰⁰ am, the middle and high levels were 605.6 mg/h and 690.6 mg/h.

It was observed that the transpiration rate of *A. diffusa* was 685 mg/h in the middle part of the day until 10⁰⁰ in rangelands with medium grazing level. It increased to 743.3 mg/h in rangeland with high grazing rate.

By mid-day at 12⁰⁰ it was found that the transpiration rate of *A. diffusa* in the middle and upper pastures was 903.7 and 1106.1 mg/h for one hour, respectively. By the second part of the day, the results at 14⁰⁰ hours decreased slightly and amounted to 712.1 and 733.2 mg.

At 16⁰⁰ and 18⁰⁰, the rate of transpiration at medium levels of grazing was 578.4 and 359.3 mg, while at high levels of feeding it was 596.5 and 496.4 mg per hour, showing the relative intensity of other levels of grazing.

It was observed that the daily transpiration rate of the *A. diffusa* in the sandy rangeland at grazing level 4 was higher than in the gypseous rangeland.

In the morning, the humidity is high and the temperature is low compared to other times of the day, so the rate of transpiration is low. But when analyzed by level of maintenance, it showed higher intensity with increasing level of maintenance.

A. diffusa was up to 602.4 and 630.6 mg/h in initial and low grazing, and a significant difference was observed in medium and high grazing and increased to 675.6 and 703.2 mg/h. Analyzing the results at 10⁰⁰, the fastest rate at the highest level of feeding was 958.5 mg/h. No significant difference was observed in the remaining initial, low and medium grazing levels. By the middle of the day, the transpiration rate is at its highest as the temperature rises and the relative humidity falls. At the initial and low levels of grazing, *A. diffusa* accelerated to 1089.5 and 1106.1 mg/h for 1 g of green mass for 1 h. The fastest rate of 1 g of green mass of *A. diffusa* was distinguished from other rangelands by acceleration up to 1203.7 and 1258.7 mg/h, corresponding to pastures



with moderate and high grazing. By 14⁰⁰ transpiration rates were most active in the primary and upper levels of rangeland, with transpiration in primary rangeland reaching 947.1 mg/h and up to 1096.3 mg/h in upper rangeland. The other two grazing rates (low and medium) were observed to be 733.2 and 772.1 mg/h in Fig 2 .

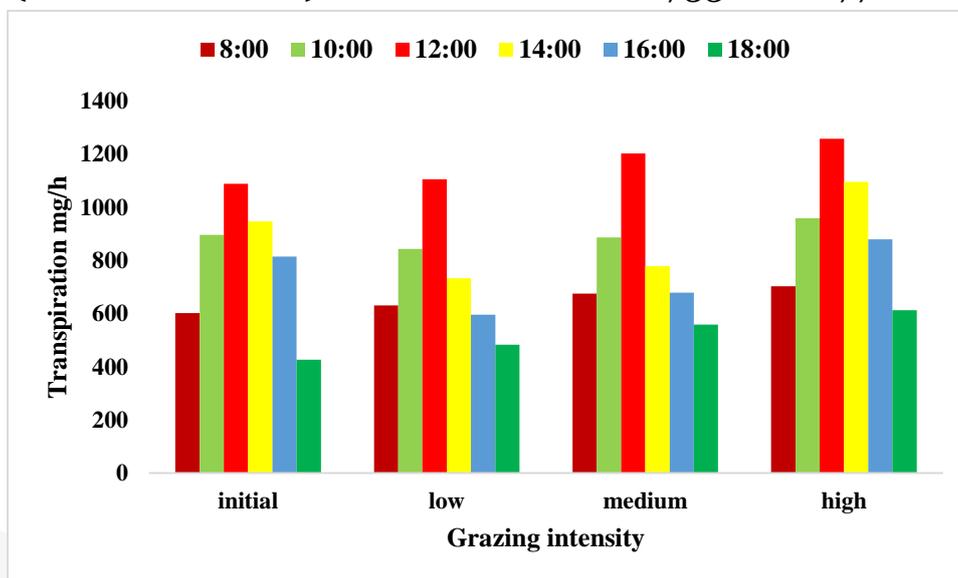


Figure 2. Daily transpiration parameters of *A. diffusa* in sandy rangelands.

By 4⁰⁰ p.m. in the afternoon, transpiration rates decreased slightly at the four grazing levels, but significant differences were observed between the initial and high grazing levels and the low and medium grazing levels.

At the initial level of grazing was 814.6 mg / h and at the low level was 596.5 mg / h. It was found to be 678.4 and 879.3 mg/h at medium and high grazing levels. At the end of the day, 18⁰⁰, our results showed that there was a big difference between the initial and high levels of grazing. In particular, it was observed that the rate of feeding in the first rangeland was 426.1 mg/h, and at higher grazing levels it increased to 612.8 mg/h. It was found to be 466.9 and 559.3 mg/h at low and medium levels of grazing.

During the analysis of the literature and our experiments, it was shown that changes in temperature and air humidity directly affect the rate of transpiration, and the level of grazing directly affects the rate of transpiration of *A. diffusa* was determined.

Summary

As a result of unregulated feeding, there were significant changes in the transpiration characteristics of *A. diffusa*. Such changes had a higher effect in sandy rangelands than in gypseous rangelands. As a result of regular livestock grazing, the



desertification process was accelerated, which stabilized the surface layer of the soil and changed its water retention properties.

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