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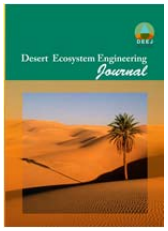

Resource Allocation in Different Organs of *Artemisia* species distributed on Southeastern Facing Slopes of Sabalan

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Extended Abstract

Introduction: This research was done with the aim of determination of Resource Allocation in Different Organs of Artemisia species distributed on Southeastern Facing Slopes of Sabalan. Iran's rangelands, with an area of 84.8 million hectares, are considered one of the largest vital areas in the country, more than 70% of which are located in arid and semi-arid areas. These areas with *Artemisia* and *Astragalus* vegetation comprise about 46% of the country's area. They are essential in preserving the environment, especially preventing soil erosion and providing fodder for livestock and wildlife. In the face of grazing pressure, *Artemisia* spp., by allocating resources to other organs, can recover themselves, maintain, and survive in rangelands; for this reason, these species have a particular priority in rangelands. Four species, *Artemisia fragrans*, *Artemisia Aucheri*, *Artemisia austriaca*, and *Ar. Melanolepis* were selected for this study because of their importance in rangelands, medicinal and fodder value, and different species on the southeastern slopes of Sablan. Determining the effect of altitude above sea level, range condition, and soil parameters on resource allocation rates in different organs of the study species and comparing resource allocation in these species are the main goals of this research.

Materials and methods: This research investigated the resource allocation rates in the shoots and roots of *Artemisia fragrans*, *Ar. Aucheri*, *Ar. austriaca*, and *Ar. Melanolepis* in Sablan's southeast rangelands. The studied area is located on Sablan's southeast slope, with geographical coordinates of 47'52 to 47'55 east longitude and 38'00 to 12'38 north latitude. It is between 1800 and 3200 meters above sea level. According to DeMarton's classification, the average annual rainfall is 414.5 mm, and the average annual temperature is 7.8 degrees Celsius. This region has 160 freezing days, and its climate is cold semi-arid. Plant samples were collected from three sites under light, medium, and heavy grazing through field visits and the four-factor method. Vegetation sampling was done in two stages between July and September 2013, systematically and randomly (regarding species presence) according to the access road and rangelands area of the study sites. Soil sampling was also done using a random-systematic method. Three intact soil samples (12 samples) were prepared at 0-30 cm depth along transect in each site.

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Results: According to the obtained data, *Ar. fragrans* grows at an altitude of 1800 to 1900 meters, *Ar. Aucheri* at 2000 to 2300 meters, *Ar. austriaca* at 2900 to 3000 meters, and *Ar. melanolepis* grows at an altitude of 3000 to 3200 meters above sea level. No significant difference was observed for the interaction effect of grazing intensity and the studied altitude range on the shoot and root biomass of the species. Soil samples from the habitats of the studied species were compared, and pH, K, OC, silt, and sand showed significant differences. pH, K, silt, and sand were significant at 1% and OC at 5%. The grazing intensity also affected potassium, organic carbon, and soil silt content. The values of pH, EC, P, sand and clay parameters did not show significant differences under different intensities. The type of plant species also influenced EC, potassium, organic carbon, silt, sand and clay. The Pearson correlation test showed a correlation between potassium and shoot biomass. Soil acidity, silt, and sand also affected the amount of root biomass. *Artemisia fragrans* production was estimated at 952.10, 554.70, and 407.80 kg per hectare under light, medium, and heavy grazing conditions, respectively. *Artemisia Aucheri's* production was estimated at 874.90, 429.60, and 238.55 kg per hectare under light, medium, and heavy grazing, respectively. In the case of *Artemisia melanolepis*, 915.30, 421.1, and 275.50 kg per hectare were estimated production values under light, medium, and heavy grazing conditions, respectively. *Artemisia austriaca* production was estimated at 877.5, 459.3, and 345.3 kg ha-1, respectively. Generally, the highest root weight and length and the highest shoot weight and length were observed under light grazing. For all four studied species, the lowest values were observed under heavy grazing. Also, there was a significant correlation between root weight and root length and between shoot weight and shoot length in all four studied species. Moreover, a significant correlation was found between root length and shoot length and between shoot biomass and root weight in all four studied species.

Discussion and Conclusion: Based on the results of this study and considering the altitudinal range defined for each species, altitude does not significantly affect species resource allocation. The highest value for the biomass of different plant organs was in low-intensity grazing, and the lowest was in high-intensity grazing. Therefore, the less degraded the rangeland, the more resources will be allocated by the existing plant species to their organs. Heavy grazing can lead to the loss of key forage species and a decrease in their aboveground plant biomass, while light grazing can improve conditions for their growth. Plant species also play a role in resource allocation patterns. Resource allocation among different organs of a species varies, and ultimately, soil characteristics determine the presence of specific species in a region. Each plant species grows and establishes itself in soils that are compatible with it. Additionally, property K significantly impacted the allocation of aboveground resources, while soil properties pH, silt, and sand significantly impacted the allocation of belowground resources. Environmental variables, pivotal in plant establishment and distribution, can either enhance or deteriorate rangelands. However, by implementing sound rangeland management practices like controlling grazing intensity and duration, we can effectively curb the adverse effects of these factors on plant communities and rangelands in general.

Keywords: resource allocation, range condition, *Ar. Aucheri*, *Ar. Austriaca*, *Artemisia Fragrans* and *Ar. Melanolepis*.