Over-under ground Biomass characteristic of annual Species (*Scabiosa rotata*) In northwest Iran (Till area of Shabestar)

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ABSTRACT: Different grazing management treatments cause diverse changes in plant growth, and these changes affect the quantity and quality of the aboveground herbage biomass produced on rangelands. Grazing can change plant species composition, manipulate some plant and ecosystem processes, and alter levels and rates of plant growth. Most range management decisions are based on quantitative measurements of production and utilization of key range plant species. Research area is of rangeland of Till village from Shabestar distract with distance is 25 Kilometers from it. This area is semi arid area and this land covered with natural range land grasses. Root and shoot in these species were sampled in one stage from late Mar late to late Aug. roots of plants stable soils on slope and provide resistance against the forces that improve slope instability. We studied *Scabiosa rotate* (M.B.) to determine its characteristics. Data were collected with random sampling in this aria with $1m^2$ in 64 quadrate plots. Mean, Max, Men over ground biomass of this plant is 0.81, 12.06, 0.07 gr/m^2 respectively.
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Key words: Over ground biomass, *Scabiosa rotate*, and rangeland.

1. Introduction

Tosake charkheie (*Scabiosa rotata* M.B.), belong to family Dipsaceae and provide forage for livestock, protect the soil from erosion, its roots enhance the soil health and soil structure by binding soil particles and aggregating them. Almost all rangelands in northwest Iran (Till area of Shabestar) are grazed continuously without any restriction on stocking rate. Inevitably, such a practice will lead to deterioration in rangeland condition. The total production of (*Scabiosa rotata* M.B.) of a plant community during a single year is designated total annual production (Mozaffarian, 2007). Aboveground defoliation can modify the partitioning of assimilates between belowground and aboveground organs and consequently the root growth of defoliated plants (Belsky, 1986; Richards and Caldwell, 1985; Snyder and Williams, 2003; Rodriguez et al., 2007). Difference of biomass production at different locations might be due to difference in climatic conditions, rainfall pattern and soil conditions.(Saleem, et al 2009) The water relations during this latter portion of the growing season limit range plant growth and herbage biomass accumulation (Saleem, et al 2009). It appeared that loss of biomass due to weathering during the winter could, in some situations, be compensated for by harvesting near ground level to include the basal, which would usually be expected to be the heaviest internodes (Boe et al., 2000). The objective of this study was to estimate the biomass production of *Scabiosa rotata* (M.B.) at one phonological Growth stage vegetative under environmental conditions.

2. Material and Methods

Study area is about 25 kilometer of Shabestar City between 15′ 38° to 38° 17′ 30″ North width and 45° 27′ 30″ to 45° 30′ East length of prime meridian and the total space of the area is almost 310.31 km2 for studding this research, we selected 10 hectare space land covered with natural rangeland grasses (Salimi faed, 2003).

In surface sampling we must have more attention incases such as Shape, Plot size, design size and the way of writing data. So from sampling the pointed case was determined by surface plat method. Quadrate size (1m*1m) is selected as the best plot. Then sampling is done by completely accident method after determine the size of optimum plot. Dada that were related to soil observation are collected that they generally include erosion information and soil protection. All of the present plants in plots were measured separately in two parts after plant sampling (Shadkami-Til and Bibalani, 2010a, 2010b, 2011).

Biological spectrum studying of area showed that the more Species of type are Hemicriptophyte and Trophite. *Scabiosa rotata*species, that grows naturally in Azerbaijan

Province of Iran and commonly found in rangelands areas, were selected this species for test in (Table1) the Scientific and Farsi name of that species with blossoming time and local position.

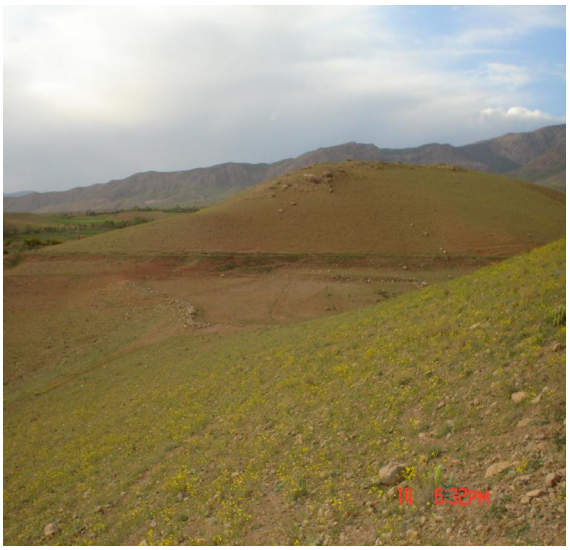

Fig 1. A part of Till rangeland from Shabestar district, East Azerbaijan province, Iran.

Table 1. Collected and determined species with blossom time and geographic height (Ghahraman, 2002, Mozaffarian, 2007).

Dicotyledonous	Angiosperms gamopetalous
Family	Dipsaceae
Species binominal name	*Scabiosa rotata*
Species Persian name	Tosake charkheie
Blossoming time	Apr-May
Geographic height	Collecting place: Hussein abad tillHeight 1460 m

Fig 2. *Scabia rotata*species.

ETHODS OF DOING RESEARCH

Because of an irregular interference specially in northwest of the country and changing control pasture to agricultural lands, in recent decades, *Scabiosa rotata* Species is omitted from Range area. And its density has remarkable decrease. We use accidental sampling method for determine this species for sampling. In simple accidental sampling method we were given equal chance to each people or society (Farahvash, 2004). In this stage we survey 1m2 Surface Plat and with rate of 3.33% from total stage by noting to studying area extent and spread Species. Sampling is done from beginning of Apr to the late of the Jul. And the end of that is done the late of the May when 60% were used from above statistics method in this season. And all of the present Plants in Plats were measured separately in two parts but after Plants sampling (Shadkami and Bibalani, 2010_a, Shadkami and Bibalani, 2010_b).

RESEARCH METHOD

For recognition of Species for sampling, we used of accidental sampling method. In simple accidental sampling method each people has equal for selecting (Farahvash, 2004). In this sampling determined accidental vegetal coverage and or un-coverage in each plot. We determined Geographical direction and elevation for each plot.

Sampling is done from early May to late July and it ended late June when 60% of area coverage was in Blossoming stage. And most of the plats were used from above Statistical method in this season. And all of the present Plants in plats after Plant sampling were measured in two parts separately. sampling from area studding Plants after sending to laboratories, Each plant was photographed to recordgeneral above- ground and below-ground morphology/architecture prior to being dissected into its component parts to determine biomass. Above-ground biomass was measured by separating the foliage, branches and stem. Each component was oven dried at 80˚c for 24 h then weighed. Below-ground biomass was determined by hosing roots clean of soil, before they were oven dried at 80˚c for 24 h then weighed. The dry weight of each plant component was recorded to the nearest 0.1gr. And statistical analyzing is done by Excel.

3. RESULTS

Results of this showed that in studding area stem height *Scabiosa rotata* was unsteady from 5.5-10.83 mm, that in average it is about 7.70 mm and the Mean, Max and Min over ground of Biomass in studding area 0.81, 12.06, $0.07gr^{-2}/m^2$, respectively. The variation in fresh weight during the maturation and senescence phase was is significant.

Table 2. Calculation is done for vegetal species.

Plant binominal name	Average height (cm)	Average root depth (cm)	Total Weight dry stem (g^{-2})	Total Weight dry root (g^{-2})
Scabiosa rotata				
Average In unit Surface	7.70	9.65	2.75	0.18
Max	10.83	12	41.23	2.39
Min	5.5	5.5	0.04	0.03

Result shows that in studying area Scabiosa rotata Biomass over ground and underground 0.81, $0.08gr^{-2}/m^2$ respectively. (Fig3)

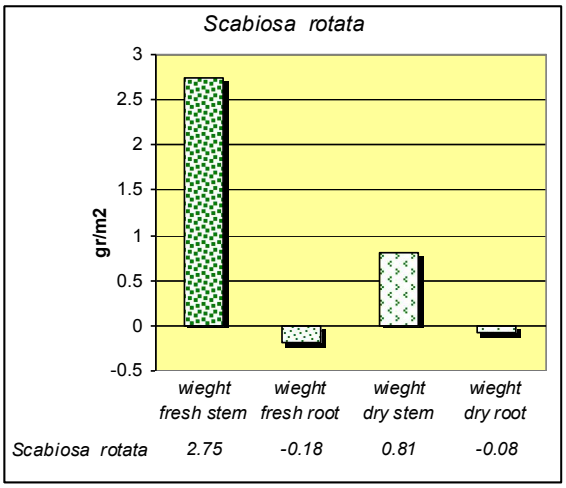

Fig 3. *Scabiosa rotata* average Biomass over ground and under ground. The results showed that Scabia rotata depth is 9.65 cm and stem height is 7.7 cm (Fig4).

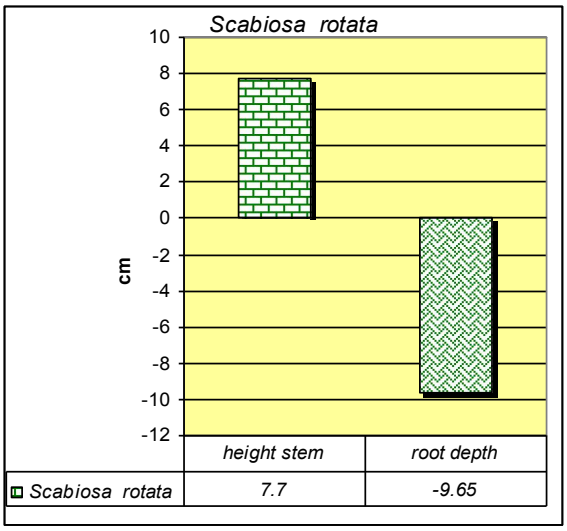

Fig 4. *Scabiosa rotata* average root depth and stem height

4. Discussions

The objective of this research work was to evaluate the seasonal rangeland productivity in term of current season growth and accumulated dead biomass of one major species (*scabiosa rotate*) In northwest Iran (Till area of Shabestar). Increasing *scabiosa rotate* species in studying area can cause specific biological qualification, and as this species increase density of over ground biomass will increase, and also the amount of soil protection and stabling will increase specially protection with wind erosion and soil losing with runoff.We concluded that water availability from April to July was vital for *scabiosa rotate* biomass production. The productivity of rangeland of Balochistan is declining due to overgrazing, over exploitation and soil erosion (Hussain & Durrani, 2007). The reasons may be due to depletion of available nutrients, timing, duration, intensity of precipitation and changes in biomass allocation patterns (Fisher et al., 1988). Herbivory and other processes destroy biomass or reduce productivity in grasslands and may also increase or decrease the production of litter (Facelli & Pickett, 1991). Estimation of the proportion of live and dead materials from vegetation is essential for accurate determination of forage production (Johnson, 1986). Soil moisture and the environmental conditions (high or low temperature) significantly affect the biomass production. The annual above ground biomass of both Chrysopogon aucheri and Cymbopogon jwarancusa was considerably affected by rainfall fluctuation between the two consecutive years (Zone, 2009) Tiller initiation must occur annually to offset mortality and maintain plant productivity, size and competitive ability (Murphy & Briske, 1992). Therefore, *scabiosa rotate* species planned grazing or

clipping (removal of dead plant material) may improve the productivity and quality of these plants at protected site in northwest Iran (Till area of Shabestar).

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