

Over-under ground Biomass characteristic of perennial Species (*Lotus gebelia*) in northwest Iran (Till area of Shabestar)

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ABSTRACT: This area is mid arid area with natural range land grasses. Balance rainfall is yearly average area 160-250 mm. In the research *Lotus gebelia* L. biomass was been studied in under – over ground plant biomass in soil studding of area with measure dept of roots and height of stems, vegetal sample was collected form studying area with random plot 1m*m statistical plant during one the vegetative season in this research. Results of this research showed *Lotus gebelia* average root dept is about 18.71cm, average stem height is about 24.21 cm and average over ground of plant biomass is 1.65 gr-2/m² and average under ground of plant biomass is about 0.52 gr-2/m².

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Key words: Root biomass, *Lotus gebelia*, rangeland and soil.

1. Introduction

Lotus gebelia L. is a perennial plant which belongs to leguminous family (Ghahraman, 2002). It grows in a wide range of reins of arid and semi- arid climates in Iran. It has also been one of the most important export items among pasture plants during the past years. Soil- plant relationships are very important to be known for management and planning of rangelands. These correlations can help managers and experts in increasing production and preventing financial damages there are different methods for evaluating range position, that all of them have special advantages and disadvantages. And each of them have different factors such as Species composition percentage, production, coverage, density, Soil position (Soil surface coverage and Erosion), cadaver, birthing, constitution, and succulence Plants were used (Bowman, Muller and Ginnies, 1985, Moghaddam, 2001). But estimation of these Parameters are time consuming and expensive. In this research they have studied the amount of under ground Biomass and *Lotus gebelia* L. Species root depth for stabling shelvy area of Til range and preventing Soil erosion of that area. This Parametr

need more attention, but it is one of the determined factors of stabling position of shelvy area in that place. Watered this Plant increase, if there is a lat of these Species in area, the destruction and erosion will be lesser in that area.

2. Material and Methods

Siding area is lied in 25 kilometer of Shabestar between 38° 15' to 38° 17' 30" from northern width and 45° 27' 30"- 45° 30' eastern length of prime meridian and the total space of the area is almost 310.31 k/m² for Studding this research, we selected 10 hectare spas from Till Range that it includes foot with southern facing of geographic. This land covered with natural range land grasses. Misho Mountain can cause weather adjustment and finally it can cause engendering of mountainous weather (Farahvash, 2004, Salimi faed, 2003). Vegetal Species, that grows naturally in Azerbaijan 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.

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

Dicotyledonous	Angiosperms gamopetalous
Family	Leguminosae
Species binominal name	<i>Lotus gebelia</i>
Species Persian name	Ahoo mash
Blossoming time	Apr-Jun
Geographic height	Collecting place: Hussein abad till Height 1460 m



Fig 1. Lotus gebelia species.

ETHODS OF DOING RESEARCH

Because of an irregular interference especially in northwest of the country and changing control pasture to agricultural lands, in recent decades, *Lotus gebelia* L. 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).

LABRATORIES STUDYING

Produced sapling from area studying Plants after sending to laboratories, each plant was photographed to record general above- ground and below-ground morphology/architecture prior to bang 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 weigh of each plant component was recorded to the nearest 0.1g⁻². And statistical analyzing is done by Excel.

3. RESULTS

Results of this showed that in studding area stem height *Lotus gebelia* was unsteady from 20-29mm, that in average it is about 24.21mm and the maximum, minimum and medium over ground of Biomass in studding area 7.2, 0.88, 1.65g⁻²/m² respectively.

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)
<i>Lotus gebelia</i>				
Average In unit Surface	24.21	18.71	1.65	0.52
Max	29	43	7.2	3.42
Min	20	5	0.88	0.09

Result shows that in studying area *Lotus gebelia* Biomass over ground and under ground 1.65, 0.52gr⁻²/m² respectively (Fig 2).

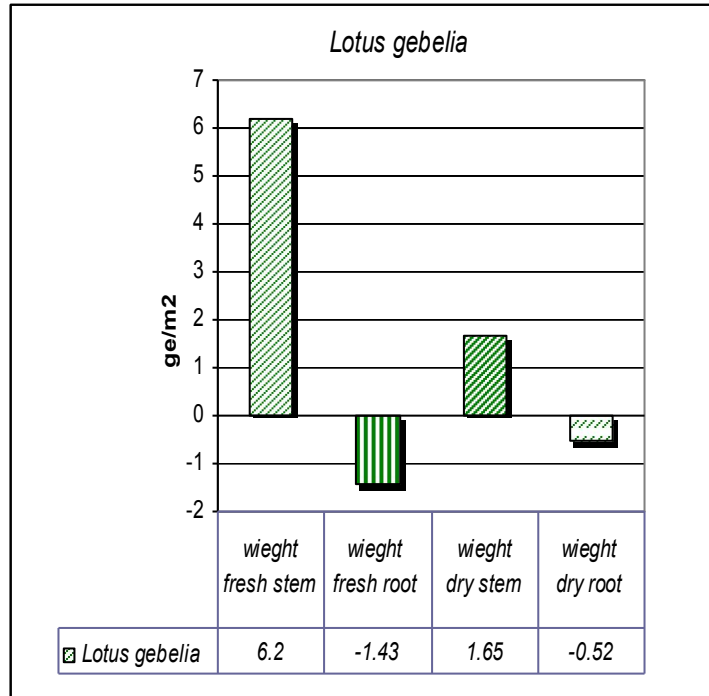


Fig 2. Lotus gebelia average Biomass over ground and under ground.

The results showed that Lotus gebelia depth is 24.21cm and stem height is 18.71 cm (Fig 3).

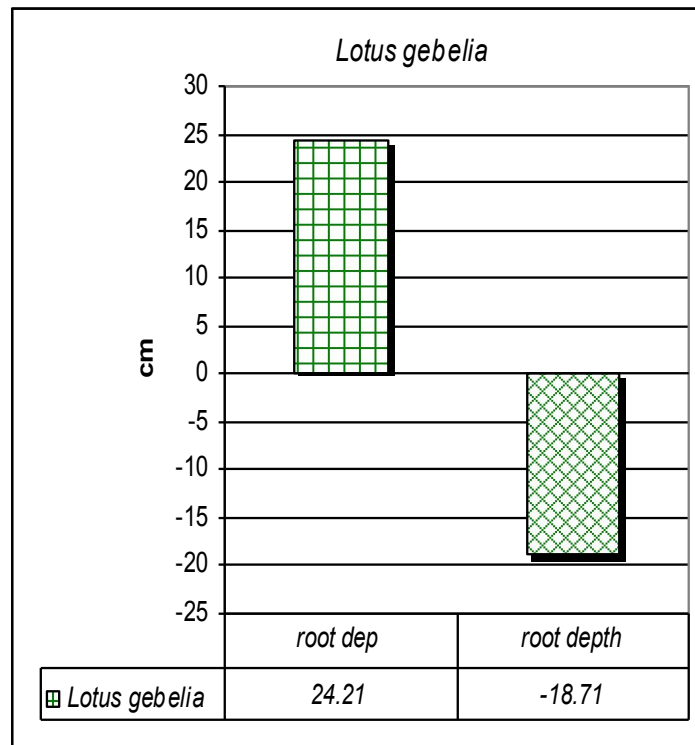


Fig 3. Lotus gebelia average root depth and stem height.

4. Discussions

Studies on quantitative assessment play a vital role in the ecology of the species (Uniyal et al., 2002). It helps in determining the performance of populations under different sets of conditions and provides desired information about the specialized ecological requirements of a taxon (Kaul and Handa, 2001). The information, thus generated, has immense potential for contributing in conservation and management of rare threatened plant species (Synge, 1985; Hutchings, 1991). In the case of Perennial plants, time of harvesting is critical because it needs to be related to availability of maximum biomass/ active components.

According to this investigation *Lotus gebelia* Species has a meaningful role in pasture stands as well as in their natural regeneration, this survey shows that due to increasing abundance of perennial Species cause remarkable increase on Soil resistant of slope area. And reason is because of pointed parameters in *Lotus gebelia* species that extensive from the point of root extension and root depth. This because of pointed parameters in *Lotus gebelia* Species that extensive from the point of root extension and root depth. In perennial Plant its extension and root influence is more than others. Roots transmittance in studying area dependent on density and amount of lateral germination of roots in rangeland shrub. Suppose that transmittance of root in land is circle. Whatever spreading roots is faster, the amount of protection and extension of durable Soil will be more (Bibalani, 2006).

Root studies of a number of species of different ages (Watson et al, 1999, Wu, and Erb, 1988) indicate that root architecture and root morphology are determined by the physical soil conditions, particularly stoniness, drainage conditions and depth to water-table, bedrock or impermeable substrata.

Data have been gathered for a number of rangelands species in east Azerbaijan by Bibalani et al. (2006). Root tensile strength varies both with growing environment and species. Root strength alone is not a good predictor of the effectiveness of a particular species for erosion control, because the soil may fail around the root long before the root actually breaks.

Physiology and ecology of shrub have been developed to approximate the contribution of shrub roots to slope stability (Gray and Ohashi, 1983., Wu and Erb, 1988). Although these models are useful to estimate and compare the strength contribution from shrub roots between different species, none are available to estimate the actual thresholds for the initiation of landslides.

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References

1. Brussard, L., Bakker, J.P. and Olff, H., 1996, Biodiversity of soil biota and plants in abandoned arable fields and grasslands under reclamation management. *Biodiversity Conserv.* 5:211-221.
2. Chpin, F.S., Walker, B.H., Hobbs, R.G, et al 1997, biotic control over the functioning of ecosystem-*Science* 277; 500-504.
3. Farahvash, F., 2004, Ecology, Tabriz: Islamic Azad University Tabriz, Pages 104-116.
4. Ghahraman, A., 2002, Folor Colored Iran, Tomes 1-24.
5. Helgason, T., Daniell, T.J., Husband, R. et al. 1998, Ploughing up the wood-wide web? - *Nature*394:431.
6. Hansson, M. and Fogelfors, H., 1998, Monument of permanent set-aside on arable land in Sweden.-*J. Appl.EEcol.* 35:758-771.
7. Hector, A., Schmid, B., Beierkunlein, C.M.C. et al 1999, Plant diversity and productivity experiments in European grassland.-*Science* 286:1123-1127.
8. Hutchings, MJ. 1991, monitoring plant populations: census as an aid to conservation. In: Goldsmith, F.B. (ed.) *Monitoring for conservation and ecology.*
9. Kaul, MK., Handa, SS., 2001, Medicinal plants of crossroads of Western Himalaya. In: Samantl, S.S., Dhar, U. and Palni, L.M.S. (Eds) *Himalayan Medicinal Plants: Potential and prospects.* Gyanoday Prakashan, Nainital.
10. Loreau, M. and Hector, A. 2001, Partitiomnig selection and complementaity in diversity experiments. *Nature* 412:72-76.

11. Mozaffarian, V., 2007, a Dictionary of Iranian, Latin, English, Persian. Tehran, Farhang Moaser.
12. Naeem, S., Hakanson, K., Lawton, J.H. et al. 1996. Biodiversity and plant productivity in a model assemblage of plant species. – *Oikos* 76:259-264.
13. Salimi faed, A., 2003, Looki to History and Geographical Shabestar, Tasuj, Sufiyan, Tehran Sibe Sorkh. Pages 234-244.
14. Shadkami-Til, H., Bibalani, GH. 2010, Under-over ground Biomass characteristics of perennial Species (*Teucrium polium*) in northwest Iran (Till area of Shabestar), *International Journal of Academic Research*, in press.
15. Symstad, A.J., and Tilman, D., 2001, Diversity loss, recruitment limitation, and ecosystem function: lessons learned from a removal experiment. *Oikos* 92:424-435.
16. Synge, H., 1985, the biological aspect of rare plant conservation. Wiley and Sons, Chichester.
17. Tilman, D., Wedin, D., and Knops, J., 1996, Productivity and sustainability influenced by biodiversity in grassland ecosystem. - *NATURE* 379: 718-720.
18. Uniyal, SK., Awasthi, A., Rawat, G.S., 2002, Current status and distribution of commercially exploited medicinal and aromatic plants in upper Gori Valley, Kumaon Himalaya, and Uttaranchal. *Curr. Sci.* 82:1246-1252.
19. Wardle, D. A., 2002, Communities ecosystems: linking the aboveground and belowground components. -princeton Unive. Press.
20. Wardle, D.A. and Nicholson, S., 1996, Synergistic effects of rangeland species on soil microbial biomass and activity: implications for ecosystems-level effects of enriched plant diversity. – *Funct. Ecol.* 10: 410-416.
21. Yeates, G.W., Bongers, T., Goede, R.G.M. et al 1993, feeds habits in soil ecologists. -*J. Nematol.* 25: 315-331.

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