



## Scholars Research Library

Annals of Biological Research, 2011, 2 (3) : 7-11  
(<http://scholarsresearchlibrary.com/archive.html>)



ISSN 0976-1233  
CODEN (USA):  
ABRNBW

### Over-under ground Biomass characteristic of perennial Species (*Alyssum longistylum*) in northwest Iran (Till area of Shabestar)

Hamideh Shadkami-Til<sup>1</sup> and Ghassem Habibi Bibalani<sup>2</sup>

<sup>1</sup>Department of Plant biology, Marand, Branch, Islamic Azad University, Marand, Iran

<sup>2</sup>Department of Agriculture, Shabestar Branch, Islamic Azad University, Shabestar, Iran

#### ABSTRACT

Knowledge of the process of change in vegetal biomass in perennial plant species is indispensable in a sound of range management. Research area is of rangeland of Til village from Shabestar district 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. The aim of this work was to assess which biomass quantitative is associated with differential productivity of *A. Longistylum*(S&G) Species. In the research *Alyssum longistylum* biomass was been studied in under –ground plant biomass in soil studying 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 plant average root dept is about 6.75 cm, average stem height is about 6.63 cm and average under ground of plant biomass is about 0.10 gr/m<sup>2</sup> and average over ground of plant biomass is about 0.60 gr/m<sup>2</sup>.

**Key word:** *Alyssum longistylum*, over-under ground Biomass. Perennial, Soil.

#### INTRODUCTION

*Alyssum longistylum* is one of the most important perennial grasses in the west arid region of Iran known, mainly due to its forage quality and its wide area of distribution. In some species, total dry biomass production is not always associated with photosynthetic rate per unit of leaf area. Instead, it may depend on many factors including life-history characteristics, canopy structure, translocation and partitioning of assimilates and environmental conditions [6, 7]. Production can be easily measured and therefore the accuracy of estimation techniques can be easily tested. In contrast, cover is easy to estimate, but direct measures of cover are very difficult to make and therefore the accuracy of cover estimates are seldom examined. Production is considered a good measure of plant dominance on a site because it reflects the amount of sunlight, water and minerals a plant is able to

capture and turn into biomass. In many rangeland areas, the variability between quadrates and the accuracy of estimating production within individual quadrates necessitates that many quadrates be sampled to detect differences between sites or years. The objective of this work was to investigate which traits are associated with higher production in this Plant species contrasting in it biomass production. The relationships among these traits and the environment of each variety are also discussed.

## MATERIALS AND METHODS

Siding area is lied in 25 kilometer of Shabestar between  $38^{\circ} 15'$  to  $38^{\circ} 17' 30''$  from northern width and  $45^{\circ} 27' 30''$ -  $45^{\circ} 30'$  eastern length of prime meridian and the total space of the area is almost  $310.31 \text{ km}^2$  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 [8]. 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 [2, 4].

Geographic height	Blossoming time	Dicotyledonous: Angiosperms Gamopetalous		Family
		Species Persian name	Species binominal name	
Collecting place: Hussein Abad till, Height 1480 m	Apr- Jun	Ghoddome sahandi	<i>Alyssum longistylum</i>	Cruciferae



Fig1. *Alyssum longistylum* Species

### Methods of Doing Research

Because of an irregular interference specially in northwest of the country and changing control pasture to agricultural lands, in recent decades, *Alyssum longistylum* 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 [8]. In this stage we survey  $1\text{m}^2$  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 [11, 9].

### Laboratories 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  $80^\circ\text{C}$  for 24 h then weighed. Below-ground biomass was determined by hosing roots clean of soil.

Before they were oven- dried at  $80^\circ\text{C}$  for 24 h then weighed. The dry weigh of each plant component was recorded to the nearest 0.1gr. And statistical analyzing is done by Excel.

## RESULTS

Results of this showed that in studying area root depth of Plant was 6.75 cm and average stem height 6.63. Respectively, the max, min and med root of Biomass in studying area 115, 0.07, 0.10  $\text{g}/\text{m}^2$ .

Table2. Calculation is done for vegetal species.

Plant binominal name	Average height (cm)	Average root depth (cm)	Total Weight dry stem(gr)	Total Weight dry root(gr)
<i>Alyssum longistylum</i>				
Average In unit Surface	6.63	6.75	0.60	0.10
Max	7.9	8.5	5.07	1.15
Min	5.5	5.75	0.82	0.07

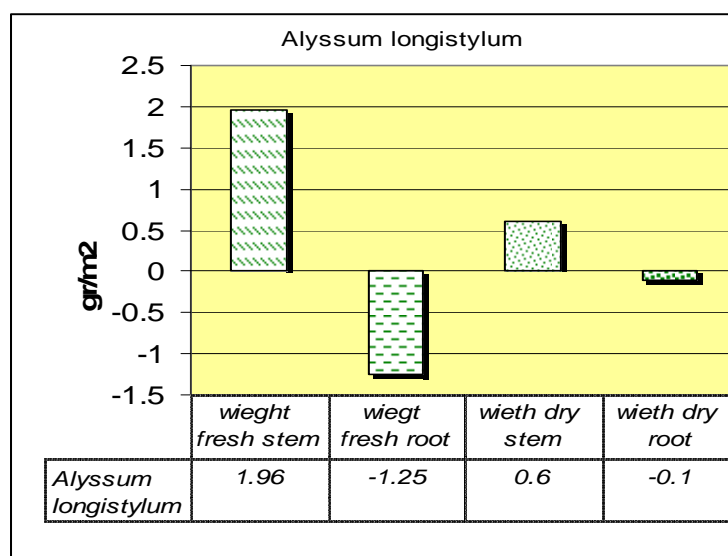


Fig2. *Alyssum longistylum* species average over underground biomass.

*Alyssum longistylum* Species results show that average over ground of Plant Biomass is about 0.6 gr/m<sup>2</sup> and average under ground of Plant biomass is about 0.1 gr/m<sup>2</sup> (Fig2).

The results showed that *Alyssum longistylum* species root depth is 6.75 mm and stem height is 6.63 mm (Fig3).

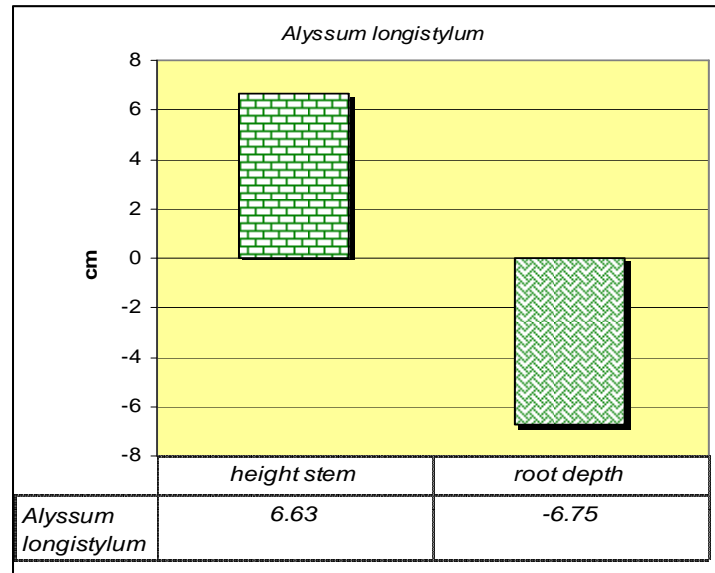


Fig3. *Alyssum longistylum* species average root depth and stem height.

## CONCLUSION

The results confirmed our hypothesis that the higher aboveground productivity of *Alyssum longistylum* was due to a larger partitioning to shoots than to roots. The productive variety invested 60% of its biomass in overground, while the other two invested least in stem + leaf. The larger proportion of roots in Encon suggests less efficiency in the use of radiation because of greater respiratory losses by roots; contrarily, the large proportion of sheaths + culms in Pichi and Arroyito would mean an extra contribution of assimilates through photosynthesis by these organs. In an experiment with *Agropyron*, [1] showed that sheaths + culms contributed more than 50% to the total photosynthesis. Increased root/shoot ratio can be the consequence of nutrient deficiency, lack of water in the soil, or temperatures unfavorable for optimal root functioning [6]. Peak standing crop may be difficult to measure in ecosystems with a large variety of species because each species will generally reach its peak phytomass at a different time of year. For example, rangeland regions in the Central Great Plains may have about equal proportions of cool season and warm season grasses. However, the cool season grasses will peak out in June while the warm season grasses will not reach peak biomass until July or August. When should peak standing crop be measured in these situations? As a compromise, peak standing crop is generally measured at the end of the growing season [5] Seasonal and annual climatic fluctuations affect biomass; therefore, production is not a suitable measure for long-term trend studies that compare data taken in different years. Root biomass (coarse and fine roots) as a proportion of total plant biomass varies between 18 and 40% depending on the species, age and site [9, 10].

**REFERENCES**

- [1] Caldwell M. M., Richards J. H., Johnson D. A., Nowak R. S., Dzurec R. S. **1981** *Oecologia* 50, 14–24.
- [2] Ghahraman, A., Floor Colored Iran, **2002**, *Tomes*, 1-24.
- [3] Grime J. P., Hunt R. **1975**, *Journal of Ecology* 63, 393–422.
- [4] Mozaffarian, V., a Dictionary of Iranian, Latin, English, Persian. Tehran, Farhang Moaser, **2007**, 310.
- [5] Murray, R.B., M.Q. Jacobson. *J. Range Manage*, **1982**, 35:451-454.
- [6] Poorter H., Nagel O. *Australian Journal of Plant Physiology*, **2000**, 27: 595–607.
- [7] Reich P. B. Variation among plant species in leaf turnover rates and associated traits: implications for growth at all life stages. 'Inherent variation in plant growth. Physiological mechanisms and ecological consequences'. (Eds H. Lambers, H. Poorter, M. M. I. Van Vuren) **1998**, pp. 476–487.
- [8] Salimi faed, A., Looki to History and Geographical Shabestar, Tasuj, Sufiyan, Tehran Sibe Sorkh, **2003**, Pages 234-244.
- [9] Shadkami, H., and Bibalani, Gh. *International Journal of Academic Research*, **2010a**, 2(6) 698-701.
- [10] Shadkami, H., and Bibalani, Gh. *International Journal of Academic Research*, **2010b**, 2(6) 110-113.
- [11] Shadkami-Til, H., and Bibalani, Gh. *International Journal of Academic Research*, **2010**, 2 (6), in press.