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Root Biomass Characteristics of *Astragalus mollis* for using in Soil Protection in Shanjan Rangelands, East Azerbaijan, Iran

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Abstract: Roots of plants stable soils on slope and provide resistance against the forces that improve slope instability. In NW of Iran (East Azerbaijan Province), rangelands was Utilized with animal grazing and changed to agricultural land use; this vegetation is unsuitable vegetation on slope to stable them. We studied *Astragalus mollis* to determine its root biomass characteristics. Data were collected with accidental sampling method (1*1 m) with 10 cm-diameter core in this aria. In total of 5 plots were collected and 25 samples were studied in this research. Minimum, maximum and mean root biomasses of this plant were 7.5, 30.5 and 9.6 g, respectively.

Key words: *Astragalus mollis*, Iran, soil protection

INTRODUCTION

Range Ecosystem stabling, optimum and continuum utilization of range without studding and knowing effective factors on its segments and animal pasturage have special importance (Mozaffarian, 2007; Shadkami-Til and Bibalani, 2010, 2011). 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 (Bidlock *et al.*, 1999; Mogaaddam, 2001). But estimation of these Parameters are time consuming and expensive. In this research we have studied the amount of under ground Biomass and *Astragalus mollis* Species (Gharaman, 2003) (Fig. 1) at rangeland area of Shanjan village, Shabestar district, NW Iran. This Parameter needs more attention, but it is one of the determined Factors of stabling position of slope area in that place. Objective of the study is determination of under-ground biomass of this plant.

MATERIALS AND METHODS

Research area is part of Shanjan rangeland from Shabestar distract with distance is about 5 Km from it. This area is hill area and we study on N aspect (Bibalani *et al.*, 2011a, b; Salimi, 2003). This region is component Flora Iran and Turan with elation between 1700-1850 m (Bibalani *et al.*, 2011b).

Root biomass was sampled in May and Jun, 2010. For recognition of Species for sampling, we used of accidental sampling method (1*1 m) with 10-cm-diameter core select 5*5 = 25 samples totally (Xiaoyan *et al.*, 2001) (Fig. 2).

Produced sapling from area studding Plants after sending to laboratories, they scale fresh weight of under ground part with careful and sensitive scale then dry weight of under ground part of Plant is determined by Avon set after drying in 80ºC temperature during 24 h (Xiaoyan *et al.*, 2001). This study have been work in Shanjan rangeland at Shabestar district in East Azerbaijan, Iran in summer 2010.

RESULTS AND DISCUSSION

Results of this study have been showed that the maximum, minimum and medium root Biomass of *Astragalus mollis* in studding area were 7.5, 30.5 and 9.6 g, respectively (Fig.3).

Root depth *Astragalus mollis* was unsteady from 120 to 280 mm, that in average it is about 200 mm and average stem height is about 250 cm.

In total of 5 plots were collected and 25 samples were studied in this research. In total of 25 samples of about 58.3% of root weight have been losses when samples dried. Soil is the erosion part of main problem on earth that it can be affected by Plants. Soil as a floor for growing can be the best store for soil materials and necessary needs such as root establishment. Vegetal Species can effect on soil chemical and Physical properties (Ardekani, 2003). Increasing *Astragalus mollis* Species in studying area can cause Specific Biological qualification, and as this Species increase density of Soil Biomass will increase, and also the amount of Soil protection and stabling will increase (Bibalani *et al.*, 2011a, b; Shadkami-Til and Bibalani, 2010, 2011). So range shrubs that have little germination in Soil surface it will have little effect on soil protection in front of created instability (Watson *et al.*, 1999).

Fig. 1: *Astragalus mollis* Species

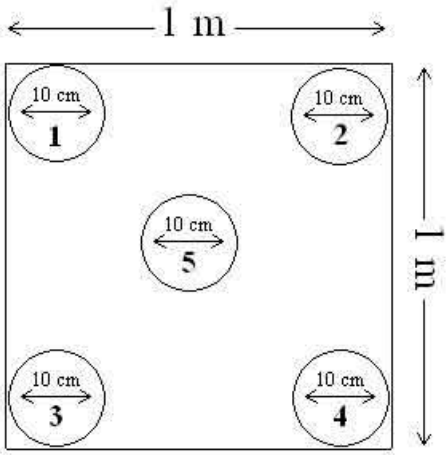

Fig. 2: Sampling design with 10-cm-diameter core in 1*1 m plot (Xiaoyan *et al.*, 2001).

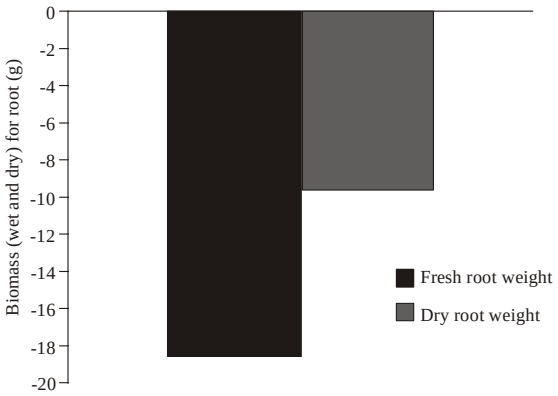

Fig. 3: *Astragalus mollis* root weight (fresh and dried weight)

Bowman (Bowman and Ginnies, 1985) by dong some research in Fort Coliniz, ranges resulted that vegetal density related to Soil Physical properties. They remarked that Species appearance in each area related to Chemical properties and coverage percent of other Soil properties.

This study has revealed and quantified the Root biomass of the *Astragalus mollis* shrub in the Shanjan range lands, the shrub has good biomass and can be used for protection the slopes in this research area and probably also in other areas where the *Astragalus mollis* is growing that need studding separately in another areas. It is a pioneer study, and the results have given estimations of the root biomass of the *Astragalus mollis* for the first time in Shanjan rangeland. It is need for studding such as this for all shrubs and plant in this area and another place for recognizing the best plant for stabilizing soil erosion.

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