

## Average stem biomass of SANGUISORBA MINOR in Shanjan Rangelands, East Azerbaijan, Iran

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**Abstract:** Plants can be used for animal grazing, in wind erosion control, to reduce water flow rates, and to increase evaporation and transpiration. In the NW of Iran (East Azerbaijan Province), rangelands previously used to animal grazing were changed to agricultural land use; this vegetation is unsuitable vegetation coverage. We studied SANGUISORBA MINOR to determine its stem biomass characteristics. Data were collected using an accidental sampling methodology (1\*1 m). In total, 8 plots were identify and 40 samples were collected for this research. In the minimum, maximum and mean stem biomass for this plant were found to me 4.5, 16.5 and 8.5 g, respectively.

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**Keyword:** SANGUISORBA MINOR , Iran, Rangeland, stem Biomass.

### 1. Introduction

Rangeland ecosystem stabilizing, optimum and continual utilization of range without studding and knowing the influencing factors on its segments and animal pasturage are of special importance (Bibalani et al., 2011a; Bibalani et al., 2011b; Mozaffarian, 2007; Shadkami-Til and Bibalani, 2010; Shadkami-Til and Bibalani, 2011). There are different methods of evaluating rangelands and all of them have advantages and disadvantages. Factors such as vegetation species composition, annual production, area coverage, plant density, soil surface coverage, constitution, and presence of succulence plants were used (Bidlock et al., 1999; Mogaaddam, 2001) but estimation of these parameters are time consuming and expensive.

Fresquez (Fresquez et al., 1990) reported an increase in vegetative production and forage quality of Blue Grama (Mata-Gonza'lez et al., 2002). Benton & Wester (Benton and Wester, 1998) reported an increase in Tobosagrass (*Hilaria mutica*) yield following applications of biosolids at levels of 7, 18, and 34 dry Mg ha<sup>-1</sup> in the Chihuahuan Desert. Although dormant season applications of biosolids seem to be more beneficial for plant growth than growing season applications during the year of biosolids application (Benton and Wester, 1998), explanations for this phenomenon have not been documented (Mata-Gonza'lez et al., 2002).

Most evidence is related to its negative effect on aboveground vegetative and reproductive plant biomass (Hutchings and John, 2003; Milchunas and Lauenroth, 1993), changes in the spatial patterning of plant canopies and soil resources (Adler et al., 2001; Bertiller and Coronato, 1994; Callaway, 1995; Schlesinger et al., 1990), the reduction of soil seed banks (Bertiller, 1996; Bertiller, 1998), the decrease in

the availability of safe micro sites for plant reestablishment (Bisigato, 2000; Oesterheld and Sala, 1990), and the invasion of woody plants (Milchunas and Lauenroth, 1993; Rodriguez et al., 2007; Schlesinger et al., 1990).

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; Rodriguez et al., 2007; Snyder and Williams, 2003).

In this research we have studied the amount of above ground biomass and occurrence of SANGUISORBA MINOR (Gharaman, 2003) (Figure 1) at the rangeland area of Shanjan village, Shabestar district, NW Iran. This parameter needs more attention, but it is one of the determining Factors of rangeland ecosystem.

### 2. MATERIALS AND METHODS:

The research area is part of Shanjan rangeland in Shabestar district with distance about 5 Kilometers from Shabestar city. The terrain in this area is hilly and we carried out the study on a site with a northerly aspect (Bibalani et al., 2011a; Bibalani et al., 2011b) (Figure 1). This region is component of Iran-Turan Flora with elevation between 1700-1850 m (Bibalani et al., 2011b).

Sanguisorba minor (Salad burnet, Garden burnet, Small burnet, burnet) is a plant in the family Rosaceae (Table 1, figure 2). It is a perennial herbaceous plant growing to 40-90 cm tall, typically found in dry grassy meadows, often on limestone soils. It is drought-tolerant, and grows all year around. (Wikipedia, 2011). SANGUISORBA MINOR is a perennial plant of this genus.



Figure 1: Part of Shanjan rangeland in Shabestar district, East Azerbaijan province, Iran.

Table 1: Scientific name for SANGUISORBA MINOR Classification Report (USDA, 2011).

Kingdom	<i>Plantae</i> – Plants
Subkingdom	<i>Tracheobionta</i> – Vascular plants
Superdivision	<i>Spermatophyta</i> – Seed plants
Division	<i>Magnoliophyta</i> – Flowering plants
Class	<i>Magnoliopsida</i> – Dicotyledons
Subclass	<i>Rosidae</i>
Order	<i>Rosales</i>
Family	<i>Rosaceae</i> – Rose family
Genus	<i>Sanguisorba</i> L. – burnet
Species	<i>Sanguisorba minor</i> Scop. – small burnet

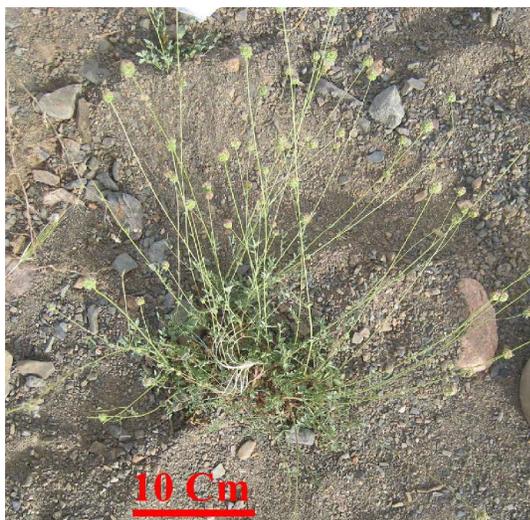


Figure 2. SANGUISORBA MINOR species

In this research, Stem biomass has been sampled in May and June, 2010. For sampling, we used an accidental sampling methodology (1\*1 m plot) in this research and selected 40 (8 plots with 5 sub sample for each of them) samples in total (Xiaoyan et al., 2001) (Figure 3).

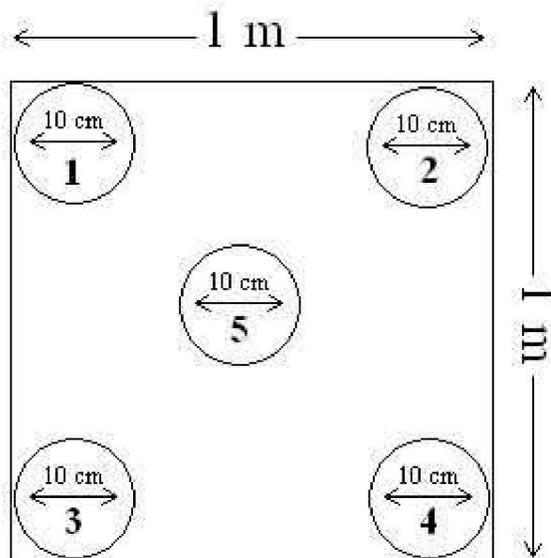


Figure 3. Sampling design in 1\*1 m plot (Xiaoyan et al., 2001). 1, 2, 3, 4 and 5 is sub sample in each main sample.

After sapling from studding area, they have been scaled fresh weight of above ground part of plant with sensitive scale then dried by Avon set in 80° c during 24 hours (Xiaoyan et al., 2001) and scaled dried weight separately. This study have been work in Shanjan rangeland at Shabestar district in East Azerbaijan, Iran in summer 2010.

### 3. RESULTS

Results from this study showed that the maximum, minimum and medium stem biomass of SANGUISORBA MINOR in the study area were 4.5, 16.5 and 8.5 g, respectively (Figure 4).

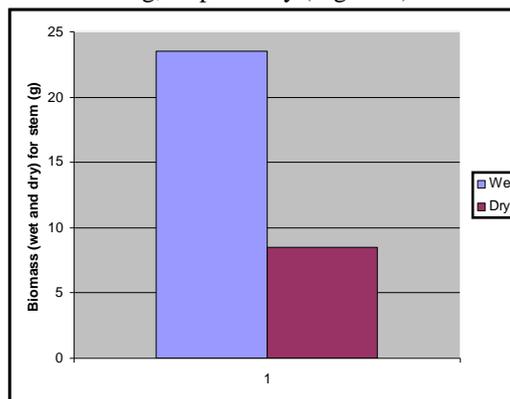


Figure 4. SANGUISORBA MINOR stem weight (fresh and dried weight).

Stem height SANGUISORBA MINOR was unsteady from 300 to 1000 mm, that average of it is about 600 mm.

#### 4. Conclusion

In total of 8 plots were identified and 40 samples were studied in this research work. From 40 samples about 66.82% of stem weight was lost when samples were dried.

Vegetation species can have an effect on soil chemical and physical properties (Ardekani, 2003). Increasing SANGUISORBA MINOR species in the study area could cause specific biological qualification, and as this species increasing density of above ground Biomass will increase, and also the amount of Soil protection and stabling will increase specially protection with wind erosion and soil lost with runoff (Bibalani et al., 2011a; Bibalani et al., 2011b; Shadkami-Til and Bibalani, 2010; Shadkami-Til and Bibalani, 2011). Study on this plant over ground biomass is so much important information especially for medicinal plant. Joudi and Bibalani (Bibalani et al., 2010) have been studied and recognized some medicinal plant of Ilkhji region, Eastern Azerbaijan Province (Northwestern Iran).

In this study we examined the biomass of this plant and results suggest that changes in the above ground cover of this plant affect by grazing or soil compaction with animal at this area as found in other studies (Bibalani, 2011a; Bibalani, 2011b; Bibalani, 2011c; Bibalani et al., 2010; Bibalani et al., 2011a; Bibalani et al., 2011b; Rodriguez et al., 2007; Shadkami-Til and Bibalani, 2010; Shadkami-Til and Bibalani, 2011) and The difference of wet weight and biomass of this plant would be expected in this area (Bibalani, 2011a; Bibalani, 2011b; Bibalani, 2011c; Bibalani et al., 2010; Bibalani et al., 2011a; Bibalani et al., 2011b; Shadkami-Til and Bibalani, 2010; Shadkami-Til and Bibalani, 2011).

This study has revealed and quantified the stem biomass of the SANGUISORBA MINOR in the Shanjan rangelands, the plant has good biomass in this research area and probably also in other areas where the SANGUISORBA MINOR is growing that need studding separately in another areas. It is a pioneer study, and the results have given estimations of the stem biomass of the SANGUISORBA MINOR for the first time in Shanjan rangeland. It is needed for studying this and other shrub species in the area and could be used in identifying plants best suited for rangeland ecosystem stability and specifically for stabilizing surface soil layers especially from water and wind erosion.

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