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Over-under Ground Biomass Characteristic of Perennial Species (*Paronychia kurdica*) in Northwest Iran (Till Area of Shabestar)

Hamideh Shadkami-Til and Ghassem Habibi Bibalani
Islamic Azad University, Shabestar Branch, Shabestar, East Azerbaijan

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 distract with distance is 25 km 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 March to late August roots of plants stable soils on slope and provide resistance against the forces that improve slope instability. The aim of this study was to assess which biomass quantitative is associated with differential productivity of *P. kurdica* species. In the research, *Paronychia kurdica* 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 1×1 m statistical plant during one the vegetative season in this research. Results of this research showed plant average root dept is about 9 cm, average stem height is about 11.45 cm and average under ground of plant biomass is about 0.12 g m^{-2} and average over ground of plant biomass is about 0.55 g m^{-2}.

Key words: *Paronychia kurdica*, over-under ground biomass, perennial, soil, indispensable, East Azerbaijan

INTROUDUCTION

Perennial grasses are important for range grazing in arid and semi-arid regions as they are the main forage resources in these ecosystems. Species from arid and semiarid regions have special features that may confer advantages for higher productivity under stress conditions (Turner, 1979). *Paronychia kurdica* 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 (Nasyrov, 1978; Lambers, 1987; Poorter *et al*., 1991; Poorter and Pothmann, 1992; Reich, 1998). Plants species may differ greatly in their inherent growth rate, even when they are grown under optimal conditions. Genetic variations responsible for differences in growth rate arise from evolutionary selection under diverse environments. In general, species from rich environments present higher growth rate than those from poor sites (Grime and Hunt, 1975; Reich, 1998; Poorter and Nagel, 2000). The objective of this study 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 METHOD

Sampling method: Study area is about 25 km of Shbestar city between '38°15-38°17'30" North width and 45°27'30"-45°30' East length of prime meridian and the total space of the area is almost 310.31 km^2 for studding this research, the researchers selected 10 ha space land covered with natural rangeland grasses (Salimi Faed, 2003). In surface sampling, the researchers 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 (1×1 m) 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 and Bibalani, 2010).

Biological spectrum studying of area showed that the more species of type are Hemicriptophyte and Comiphite. *Paronychia kurdica* species that grows naturally in Azerbaijan province of Iran and commonly found in rangelands areas were selected this species for test in following table the Scientific and Farsi name of that species with blossoming time and local position (Table 1 and Fig. 1).

Research method: For recognition of species for sampling, the researchers used of accidental sampling

Corresponding Author: Hamideh Shadkami-Til, Islamic Azad University, Shabestar Branch, Shabestar, East Azerbaijan

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. The researchers 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. 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 record general 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 0.1 g and statistical analyzing is done by Excel.

Fig. 1: *Paronychia kurdica* species

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

		Dicotyledonos		
		Angiosperms	Gamopetalous	
Characteristics	Blossoming time	(Persian name)	(binominal name)	Family
Geographic height (1430 m) Collecting place (Hussein Abad Till)	Apr.-Jun.	Narmoo	*Paronychia*	Paronychiaceae *kurdica*

RESULTS AND DISCUSSION

Results of this showed that in studding area stem height *Paronychia kurdica* was unsteady from 8.5-18.5 mm that in average it is about 11.45 mm and the mean, max and min underground of Biomass in studding area 0.12, 0.77, 0.06 g m^{-2}, respectively. The variation in fresh weight during the maturation and senescence phase was is significant (Table 2). In studying area *Paronychia kurdica* biomass over ground and under ground 0.6 and 0.12 g m^{-2}, respectively (Fig. 2). *Paronychia kurdica* depth is 16.55 cm and stem height is 14.45 cm (Fig. 3).

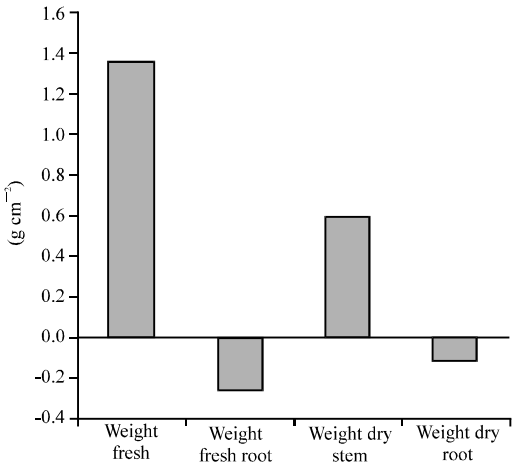

Fig. 2: *Paronychia kurdica* average biomass over ground and under ground

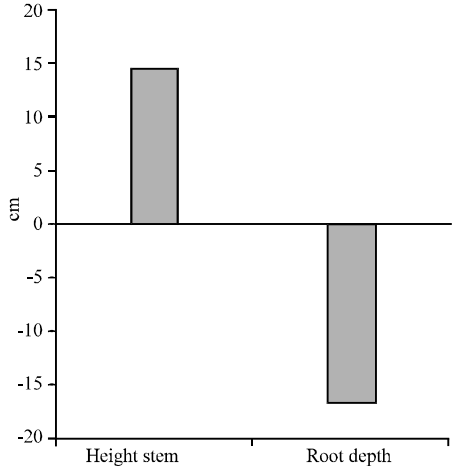

Fig. 3: *Paronychia kurdica* average root depth and stem height

Table 2: Calculation is done for vegetal species

Plant binominal name *Paronychia kurdica*	Average height (cm)	Average root depth weight (cm)	Total weight fresh stem (g)	Total weight fresh root (g)	Total weight dry stem (g)	Total weight dry root (g)
Average in unit surface	11.45	16.55	1.37	0.26	0.55	0.12
Max.	18.50	25.50	13.04	1.37	4.84	0.77
Min.	8.50	9.00	0.21	0.14	0.25	0.06

CONCLUSION

The results confirmed the hypothesis that the higher above-ground productivity of *Paronychia kurdica* 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, Caldwell *et al*. (1981) showed that sheaths+ culms contributed >50% to the total photosynthesis. Increased root/shoot ratio can be the consequence of nutrient deficiency, lack of water in the soil or temperature unfavourable for optimal root functioning (Brouwer and de Wit, 1969; Poorter and Nagel, 2000). Similarly, along an aridity gradient in Patagonia, Schulze *et al*. (1996) found that plant total biomass decreased as precipitation decreased but below-ground biomass decreased at a lower rate than above-ground biomass, resulting in increasing root/shoot ratios. Fernandez and Reynolds (2000) studying growth parameters and drought tolerance in eight desert grasses did not find a trade-off between total biomass or root/shoot ratios and drought tolerance. Instead in this experiment, the increases in the root/shoot ratio showed by Encon implied a trade-off in total dry mat\ter production. 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 (Shadkami and Bibalani, 2010).

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