

Autecology of Endemic Plant “*Prangos haussknechtii* Boiss” in Kohgiluyeh-va-Boyerahmad Province, Iran

Shahab Mirinejad

Agriculture and Natural Resources Research Center
& Education of Kohgiluyeh-va-Boyerahmad Province, Yasouj, IRAN.

(Corresponding author: Shahab Mirinejad)

(Received 10 January, 2015, Accepted 10 February, 2015)

(Published by Research Trend, Website: www.researchtrend.net)

ABSTRACT: In order to investigate the Autecology of *Prangos haussknechtii* Boiss this project has been conducted within 2008 to 2011. *P. haussknechtii* is an endemic plant in Kohgiluyeh-va-Boyerahmad Province has which is extensively used for grazing of domesticated animals. *P. haussknechtii* with deep root can use for prevention of soil erosion. This research, using scientific resources and GPS device obtained the geographic characteristics of the region such as latitude, longitude, height, direction and slope and the plant distribution map. Seeds of the plant were collected from growth place in the summer 2008 and then cultivated and established in autumn 2008 using decayed animal manure. The Results indicated *P. haussknechtii* germinates in the second week of April, begins its palmate state and gets a few leaves in the first week of July and continues to grow until the second week of June. At this time, the plant growth is completed in the first year and is withered at that year. In respect to phenology, there is not any significant different between cultured plants in the farm and the growth areas plants in the Province.

Key words: Autecology, endangered plant, kohgilooye-va-Booyerahmad, prangos

INTRODUCTION

Kohgiluyeh-va-Boyerahmad is a province located in the southwest of Iran (Fig.1). Primarily, it is a mountainous province and Zagross Mountain Ranges stretch from the northeast to the southwest of

Kohgiluyeh-va-Boyerahmad. There is more than 4000 meters difference of elevation between the highest point of the province in Mount Dena (4,409 meters) and the lowest point in HaiderKarrar area in Gachsaran (180 meters).

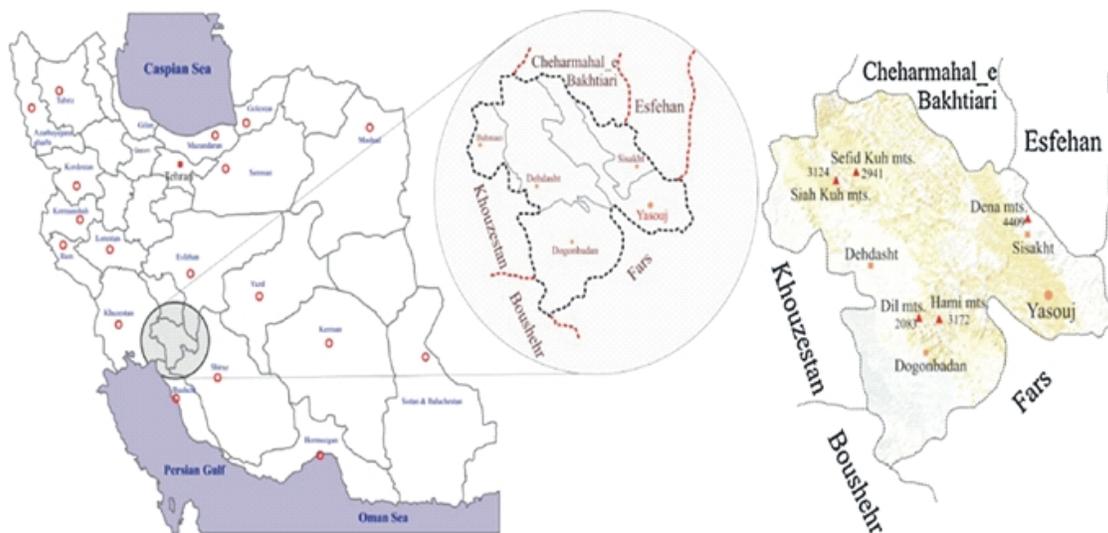


Fig. 1. Map of the Kohgiluyeh-va-Boyerahmad province.

The province is in Neighborhood with a variety of climates such as cold-and-dry and hot-and-humid climates has generated a dual climatic characteristic that is cause of plant and animal biodiversity in the province (Mirinejad *et al.*, 2008). Degradation and risk exposure such as overgrazing, plowing and land use changes, drought and low rainfall, debit human nature and change of use of land, pasture, such as plant construction are important factors that most species of medicinal plants, and Pasture are at risk (Mirinejad, 2013). The genus *Prangos* (Jashir in Persian) belongs to the Umbelliferae family and consists of fifty species (Evans, 1989). They have been used in traditional medicine as emollient, carminative (Zargari, 1988), tonic, anti-flatulent, anthelmintic, antifungal and antibacterial agents (Bouaoun *et al.*, 2005). Phytochemical investigations on different species of *Prangos* have led to the isolation of coumarins (Sadraei *et al.*, 2012) and volatile oils (Sajjadi *et al.*, 2011) from different parts of the plants. due to importance role of prangos in management of grassland. Investigation of autecology and phenology of *Prangos haussknechtii* had been performed.

MATERIAL AND METHODS

First, using library resources, journals and available maps, and consultation with medicinal plants experts and studying the maps of the flora and herbarium, species habitat in the Province was identified and habitat characteristics such as coordinates, elevation, direction and slope percent were recorded using GPS devices in the field and plant distribution maps.

To determine phenology and growth duration, from the beginning of growing season, plant growth area was

biweekly visited and vegetative stages of plant growth (including start germination, tillering and multi-leaf, appearance of flowering stems, fruit development, milky seeds, seed maturity, seed abscission, wilting and drying, temporary re-growth falling dormancy and winter dormancy) were recorded in related forms.

To determine vegetation types of area, various vegetation types were determined by moving along vertical transect and accompanying plant species were recorded.

In pedological studies, as well as determination of soil appearance condition and stone or grains presence in the soil, profiles were dug in the plant habitat and samples of the soil were collected and transported to the laboratory in order to measure the experimental of soil texture, PH, EC, and the macro and micro elements.

In the seed maturity season, the *Prangos* plant seeds were collected and preserved in cold storage at temperatures below zero to pass dormancy period and then, the seeds were planted in the second half of November. The *Prangos* seeds in holes with the space 30 cm apart in a line and a line spacing of 25 cm apart in 2 × 2 m plots were planted. All different stages of plant phenology were recorded.

RESULTS AND DISCUSSION

As it is shown in (Table 1), *P. haussknechtii* grows in 20-75% on the sides of Saverz, Koohgol and Abnahr Mountains in different directions with homogenous density. The mean heights of samples were 75 - 90 cm. Based on these accomplished studies, *Prangos* accompanying species were as follow: *Astragalus* ssp, *Rheum persicum* □ *Daphne mucronata* □ *Qercuspersica* □ *Prango* ssp.

Table 1: Required information for habitats of *Prangos haussknechtii*.

Information	Habitat 1	Habitat 2	Habitat 3
Site	Saverz Mt	Abnahr Kakan	Koohgol
Elevation	2825	2680	2700
longitude	30° 42' 15.3"	30° 41' 11.8"	30° 50' 9.9"
latitude	51° 7' 3.5"	51° 41' 21.8"	51° 32' 19.8"
Topography condition	Mountain	Mountain	Mountain
Slope direction	All direction	South	All direction
Percentage slope	20-60	25-75	30-70
The nearest weather station	Choram	Yasooj	Sisakht
Plant distribution: 1-hill 2-Uniform 3-Random	Uniform	hill	Uniform
Dominant type name 1	<i>Qercus persica</i>	<i>Prango ssp</i>	<i>Rheum persicum</i>
Dominant type name 2	<i>Daphne mucronata</i>	<i>Daphne mucronata</i>	<i>Daphne mucronata</i>
Height average of 5 sample (cm)	80	75	90
The average around of 5 sample (cm)	60	70	80
Location of the plant Rocky - soil and rock - soil	Rocky - Soil	Rocky - Soil	Soil
Name of associated species	<i>Qercus persica</i> - <i>Daphne mucronata</i>	<i>Prangossp</i> - <i>Daphne mucronata</i>	- <i>Daphne mucronata</i> <i>Rheumpersicum</i> -

Table 2: Phenology of *Prangosh aussknechtii* Boiss.

Vegetative stage	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Germination	■	■											
Tillering		■	■	■	■	■							
Flowering					■	■							
Fruits appearance						■							
Milky seed						■							
Seed maturity							■	■					
Falling acorns							■	■					
Broken stems								■	■				
Establish the seeds								■	■				
Winter Sleep									■	■	■	■	■

The results of pedological study shows that the amount of the elements Fe, Zn, Cu, Mn are respectively 9.98-15.64 ppm, 0.66-1.32 ppm, 0.54-2.38 ppm, 12.26-14.34 ppm. The type of soil texture is Si-Cl, Sa¹. The research concluded that the plants can growth up in the soil texture of Si-Cl and Sa¹ in cold areas of Province.

The results (Table 2) shows that *Prangos* starts to germinate from late March to early April and tillers to mid-June and continues its growth. The initial inflorescences emerge in late June and seeds clusters appear in July. After this stage to early August, seeds pass softness. Seeds rape in late August to early September. The seeds fall from late September to late October, the plants then wilt and the stems collapse. From mid-October to early November, seeds found on the ground and vital activities of the plant stop in mid-November.

CONCLUSION

This research has been performed to investigate the phenology and cultivation of *Prangos haussknechtii* Boiss in Kohgilouyeh-va-Boyerahmad Province and also to study the main reasons of the plant extinction. According to the results, *Prangos haussknechtii* Boiss is extensively used for grazing of domesticated animals endangered due to overgrazing. The plant has also shown the ability to be cultivated in cold areas of the Province where the precipitation is mostly snow. According to this study, the best planting season is late November when the plant biological activities are minimal. Because of the importance of medicinal

cultivation and domestication, it is recommended to do ecological research on other pastoral plants. In other hand *Prangos haussknechtii* seeds can be used for regeneration and reproduction in areas where good potential for growing. Due to the deep roots and wide canopy, this plant can be used to prevent of soil erosion.

ACKNOWLEDGEMENT

The work described in this paper was financially supported by a research grant No. 0-09-09-87090 from Kohgilouyeh-va-Boyerahmad Agricultural and Natural Resources Research Center of Agricultural Research and Education Organization (AREO), Iran.

REFERENCES

- Bouaoun, D., Hilan, C., Garabeth, F. & R. Sfeir. (2005). Antimicrobial activity of the essential oil of the wild osteoblast cells. *J. Pharmacol Exp. Ther.*, **14**: 1290-1299.
- Evans, WC. (1989). Pharmacognosy. 13th ed., BailliereTindall, London, 1989.P 205.
- Mirinejad, Sh., M. Yoosefi., S. Mozaffari & A. Asadpoor (2008). Biodiversity and ecological research on plant species in kohgiloyevaboyerahmad province, *1th international Conference of Climate Change and trees Chronology in the Caspian ecosystem*, 14-15 may. Department of Natural Resources, Sari, Iran.
- Mirinejad, Sh, (2011). Final report of project in Research Center for Agriculture and Natural Resources in Kohgilouyeh-va-Boyerahmad Province, Yasooj, Iran.

- Mirinejad, Sh., B. Hassanpour, M., Yousefi and E. Jahantab (2013). Investigation of Autecology and Cultivation of Rare Endangered Medicinal Plant "Kelussiaodoratissima Mozff" in Kohgilouyeh-va-Boyerahmad Province.
- Sadraei, H., Y. Shokoohinia, S.E. Sajjadi and B. Ghadirian (2012). Antispasmodic effect of osthole and *Prangos ferulacea* extract on rat uterus smooth muscle motility, *Research in Pharmaceutical Sciences.*, **7**(3): 141-149.
- Sajjadi, S.E., Y. Shokoohinia and S. Gholamzadeh, (2011). Chemical Composition of the Essential Oil of the Root of *Prangos ferulacea* L. *Lindl.Chemija.* **22**: 178-180.
- Zargari, A. (1988). Medicinal Plants. Tehran: Tehran University Publications; Vol. **2**, Pp. 553.