



Full Length Article

Comparison of Saplings character in the different nursery origin in Hyrcanian forest

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ABSTRACT

Seeds and wildlings are common used by nursery operators for seedling production. The aim of this research is a Comparison of Saplings character in the different nursery origin in Hyrcanian forest (Hyrcanian forest). Four comparisons of Saplings character in the wildlings and nursery seedlings origin in Hyrcanian forest, selected two nurseries include wildlings and nursery. For study Saplings character used the 3×3m plots. In each section inventory 30 sample and measured quantity and quality parameter of seedlings. For compare of seedlings parameter used the ANOVA and T-test. Results showed that the mean of Potassium root, Potassium shoot, Phosphate Root, Leaf nitrogen, Root nitrogen, Stem weight, Root weight, Leaf weight in wildlings seedlings are higher the nursery seedlings, but in the mean of survival rate, Succulence, Shoot nitrogen, Potassium leaves in nursery seedlings are higher in the wildlings seedlings. The results of T-test showed that different between phosphateroot in the nursery and wildlings seedlings are significant. General results showed that the wildlings seedlings are the higher parameter in compare the nursery seedlings, in the base results of this study suggested to natural restoration of Hyrcanian forest

Key words: Saplings character, nursery seedlings, wildlings seedlings, Hyrcanian forest, Sangdeh forest

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INTRODUCTION

Nursery seedling production is the most common practice for raising planting stock and the use of plants produced from the nursery is generally the most efficient and effective way of establishing a forestry plantation in the forest [8].

Iran is the most attractive and versatile country among all countries in south-west Asia relating to vegetation. Hyrcanian (Caspian) forest in northern Iran has a richness of biological diversity, with endemic and endangered species, and a diverse range of economic and social conditions. About 45% of the Hyrcanian forests are located in mountainous areas, where forest lands are not readily accessible with ground-based logging equipment's, but cable yarning technologies are still undeveloped in this forest area (Jourgholami, 2012). These forests cover 1.8 million hectares of land area and are none commercial forests of Iran. Approximately 60 percent of these forests are used for commercial purposes and the rest of them are degraded. The Hyrcanian forests are extended at the altitude of a maximum of 2800 meters from sea level and have an uneven topography and very steep slopes. They are suitable habitats for a variety of hardwood species such as beech, hornbeam, oak, maple, alder, and encompass various forest types including 80 woody species. Gap dynamics is one of the key issues in contemporary forest ecology. Gaps are studied from various perspectives: stand dynamics and structure, species composition, nature conservation, and forestry practice.

The researcher studied of Gap Regeneration of Virgin Fir Forest in Mount Sejila in Tibet and It was discovered that the gaps with area about 100 m² is the most appropriate for seedlings lower than 20 cm in height to exist; if the area of gap is over 100 m², the amount of seedling reduces with the increase of gap area; the gaps with area about 300 m² is the most appropriate for young fir and small-diameter tree to grow [1]. The researcher studied the effect of gap size for Improvement of beech (*Fagus orientalis*) natural regeneration in hyrcanian forest and results showed that with increased gap size, contrary to maple (*Acer velutinum*), beech (*Fagus orientalis* Lipsky) frequency decreased. Generally, it can be deduced that regeneration characteristics, from viewpoint of establishment and growth, are more limited in

greater gaps (9-11 are) but are benefited by more favorable conditions in smaller gaps (1-2 and 4-5 are), where removal of tree elements is possible as a single tree [4].

The researcher studied the response of oriental beech (*Fagus orientalis* Lipsky) seedlings to canopy gap size and results showed that the Shoot growth of wildings and nursery seedlings differed in response to gap size variation. Shoot growth of wildings was higher in small gaps than in larger openings, whereas for nursery seedlings the inverse was observed. Most beech seedlings were not discolored or slightly discolored under gaps of 50, 200 and 600 m² and were slightly too moderately discolored in the open. There was a general tendency for higher discoloration in larger openings. It is concluded that small non-regenerated canopy gaps (≤ 200 m²) of beech forests in northern Iran can be restored by planting beech wildings as well as nursery seedlings in small openings, whereas nursery seedlings are preferred in larger gaps (≥ 600 m²) [6].

The researcher studied the Effect of Gap Size on Qualitative Characteristics of Saplings of Regeneration Groups in a Mixed Beech Stand and results showed that the gap size had major effect on qualitative characteristics of maple saplings at confidence level of 95%. The frequency of medium quality class (forked) of maple saplings that is a light demanding species in small gaps was more than those in the medium and large gaps. In addition, the results indicated that beech sapling under crown canopy had lower quality than those in gaps [5].

The researcher studied the effect of Natural Gap Size in Canopy Cover on Physical and Chemical Characteristics of Soil Upper Layer in Jamand District, Mazandaran Province, and According to the results achieved the amount of the percentage of moisture in results showed that by increasing the gap size, the percentage of moisture in these two surface layers was decreased. Organic Carbon (OC) and amount of C: N in the H layer had a significant difference at 5% level, as the highest amount of them was in the first class and the lowest amount was in the second class. Also, the total Nitrogen (N) of soil showed a significant difference at 5% level, as the highest amount of it was observed in the fourth class. Generally in this research, the second class could provide the best condition for decomposing and increasing the rate of nutrient return [6]. The aim of this research is a comparison of Saplings character in the different nursery origin (wildings and nursery seedlings) in Hyrcanian forest

MATERIALS AND METHODS

Site description

This research was investigated in the Sangdeh forest, Mazandaran province, in the northern state of Iran (Figure 1).

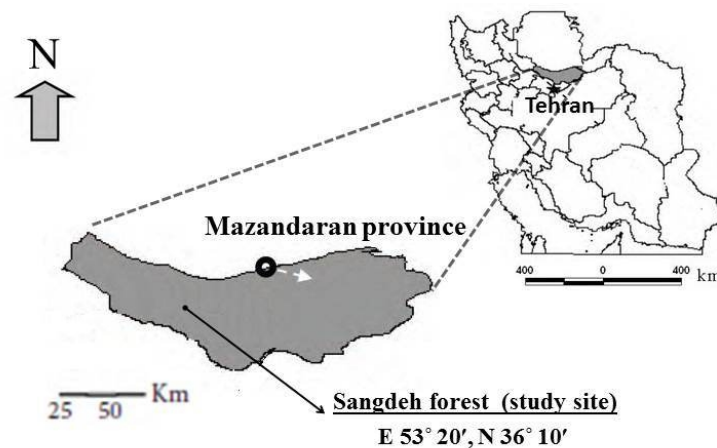


Figure 1: the location of study area in Iran and Mazandaran province

Four comparisons of Saplings character in the wildings and nursery seedlings origin in Hyrcanian forest, selected two nurseries include wildings and nursery. For this study planted *Fagus orientalis* Lipsky in the wildings and nursery seedlings. For study Saplings character used the 3×3m plots. In each section inventory 30 sample and measured quantity and quality parameter of seedlings. For compare of seedlings parameter used the ANOVA and T-test. Data analyzing was done by SPSS16 and Excel software.

RESULTS AND DISCUSSION

In general, the seedling enhancement project is concerned with questions of how seedling quality can be improved, how supply of high quality seedlings can be sustained and how the financial sustainability of community and private nurseries can be improved.

Table 1: Compare of seedling parameter between nursery and wildings seedlings and results of t-test

Sig	t	nursery seedlings	wildings seedlings	Seedlings characters
0/82	-0/24	82a	80a	survival rate
0/41	-0/76	2/1a	1/9a	Succulence
0/99	0/002	309/7a	309/9a	Leaf area
0/50	0/711	2/6a	3/3a	Leaf weight
0/94	0/078	13/9a	14/1a	Rootweight
0/25	0/28	8/7a	13/7a	Stem weight
0/33	-1/06	0/8a	0/7a	Shoot nitrogen
0/29	1/17	0/7a	0/8a	Root nitrogen
0/71	0/39	2/3a	2/4a	Leaf nitrogen
0/25	1/27	0/01a	0/1a	Phosphate shoot
0/03	2/83	0/07b	0/13a	Phosphate Root
0/69	0/42	0/14a	0/14a	Leaf phosphate
0/29	1/16	0/26a	0/29a	Potassium shoot
0/14	1/69	0/31a	0/36a	Potassium root
0/07	-2/21	0/83a	0/65a	Potassium leaves

Results showed that the mean of Potassium root, Potassium shoot, Phosphate Root, Leaf nitrogen, Root nitrogen, Stem weight, Root weigh, Leaf weight in wildings seedlings are higher the nursery seedlings, but in the mean of survival rate, Succulence, Shoot nitrogen, Potassium leaves in nursery seedlings are higher in the wildings seedlings. The results of T-test showed that different between phosphate root in the nursery and wildings seedlings are significant.

CONCLUSION

Seeds and wildings are the common germplasm used by nursery operators for seedling production. Seeds are often used for exotic species. The location of mother trees in native forests makes it difficult for nursery operators to determine the fruiting season and the appropriate period to collect seed. Wildings are usually available instead of seeds. Results showed that the mean of Potassium root, Potassiumshoot, Phosphate Root, Leaf nitrogen, Root nitrogen, Stem weight, Rootweigh, Leaf weight in wildings seedlings are higher the nursery seedlings, but in the mean of survival rate, Succulence, Shoot nitrogen, Potassium leaves in nursery seedlings are higher in the wildings seedlings. The results of T-test showed that different between phosphateroot in the nursery and wildings seedlings are significant.

Overall results showed that the wildings seedlings are the higher parameter in compere the nursery seedlings, in the base results of this study suggested to natural restoration of Hyrcanian forest

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