

# QUANTITATIVE CHARACTERS VARIABILITY AND THE BEECH GENETIC RESOURCES CONSERVATION IN VALEA FAGILOR NATURAL AREA

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Received: 15 February 2016 / Revised: 26 February 2016 / Accepted: 30 March 2016 / Published: 05 May 2016

**Key words:** quantitative characters, morphological variability, isolated beech arboreta, seedling  
**Abstract:** An very important priority in the genetic resources conservation are the isolated beech arboreta which manifest cumulated effects of the limitative ecological factors and even inbreeding consequences. In the natural area *Valea Fagilor* from the National Park *Munții Măcinului* the *plus* beech trees were selected based on general criteria as growth rapidity with diameter and height measurements. *In situ* conservation of the beech genetic resources in *Valea Fagilor* natural area reclaim specific and urgent measures to stimulate the natural regeneration.

## INTRODUCTION

Beech arboreta in natural area provide a very valuable biologic material (seeds or cuttings) for an efficient and lucrative genetic forestry improvement consisting in seed orchards establishment or afforestation/reforestation activities (2,3). On the other hand, with a view to preserve all natural beech genetic resources, it is necessary to grant a particular attention to the isolated beech arboreta with a reduced number of trees, which manifest cumulated effects of the limitative ecological factors and even inbreeding consequences (1). A high variation within populations and little differentiation among populations it has been proved using provenance trials and with genetic markers (isozymes and DNA markers) (6).

The aim of this paper is to identify the proportion and the morphological variability of the beech *plus* trees in an isolated beech population from the National Park *Munții Măcinului*, Tulcea county – Romania.

## MATERIALS AND METHODS

In July 2012, in the natural area *Valea Fagilor*, we delimited 3 circular testing areas (each one of 500 m<sup>2</sup>) containing beech trees only to the altitude between 225 and 230 m and northern exposure. We identified the proportion of beech *plus* trees in each studied area. The *plus* beech trees were selected based on general criteria as growth rapidity, axle and crown height, pest and disease resistance, abundant fructification and good quality of seeds (5). For our study, we have measured the diameter and height to value the class quality.

## RESULTS AND DISCUSSIONS

According to the measurements of diameter and height performed, in the first testing area with the highest number of beech *plus* trees – 11, resulted a general average of diameter and height – 43,27 cm, respectively 34,72 m. A field specific feature is represented by a northern slope which shade the arboretum about 80% of day. As consequence, in this area it was registered the highest values of the height of trees – 34,72 m on an average and the most reduced values of the diameter – 43,27 cm on an average (table 1).

Table 1 Testing area nr. 1

Nr. ct.	Proportion of beech <i>plus</i> trees (%)	Diameter (cm)	Height (m)	Quality class
1		48	38	I
2		50	38	I
3		50	36	I
4		34	30	I
5		38	32	I
6	<b>64,70 %</b>	46	36	I
7	(11 plus trees/17 total nr)	36	36	I
8		46	38	I
9		44	34	I
10		42	32	I
11		42	32	I
Av.*		<b>43,27</b>	<b>34,72</b>	

Table 2 Testing area nr. 2

Nr. ct.	Proportion of beech <i>plus</i> trees (%)	Diameter (cm)	Height (m)	Quality class
1		40	28	I
2		42	30	I
3		52	28	I
4	<b>46,15%</b>	46	30	I
5	(6 plus trees/13 total nr.)	44	30	I
6		60	32	I
7		40	26	I
8		36	26	I
Av.		<b>45</b>	<b>28.75</b>	

Table 3 Testing area nr. 3

Nr. ct.	Proportion of beech <i>plus</i> trees (%)	Diameter (cm)	Height (m)	Quality class
1		50	26	I
2		44	24	I
3	<b>35,71%</b>	44	28	I
4	(5 plus trees/14 total nr.)	44	22	I
5		38	20	I
Av.		<b>44</b>	<b>24</b>	

\*- average

In the second testing area we selected 8 beech *plus* trees from total number of 13. After the measurements, we registered 45 cm average in diameter and 28,76 m average of height. In this area, the arboretum is shaded 50% of day (table 2).

In the third testing area we registered only 5 beech *plus* trees and the most reduced proportion – 35,71%. The notable diminution of the number and the height of trees (24 m on average) is caused by sunbathed area conditions (shade maximum 20% of day)(table 3). In time, the beech might be replaced by other forestry species (e.g. hornbeam, sessile oak or lime).

## CONCLUSIONS

The number and the proportion of beech *plus* trees in the testing areas show a constant diminution determined by the specific field features and exposure conditions with shaded or sunbathed regime.

The average values of the height and diameter of the beech *plus* trees are reverse proportionally concerning the increase and decrease in the testing areas

*In situ* conservation of the beech genetic resources in *Valea Fagilor* natural area reclaim specific and urgent measures to stimulate the natural regeneration (4). In this respect it is necessary to protect the seedling, the yearly fruit-bearing checking and testing seeds quality.

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