

# GENETIC DIVERSITY OF SESILE OAK FROM THE AONB „AVALA“ AREA ESTIMATED ON THE BASIS OF ACORN MORPHOLOGICAL TRAITS



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## Introduction

Natural sessile oak populations in forest stands on the territory of the city of Belgrade are found in small areas and their survival is endangered by climate change, small population size, low species competitiveness, etc.

In order to preserve the present sessile oak genepool in population in the area of outstanding natural beauty (AONB) „Avala“, and controlled usage of genetic resources, the intrapopulation variability research has been conducted, on the basis of morphological acorn traits.

## Method

From 50 trees of top quality phenotype and good health condition, ocularly healthy and undamaged acorns were collected.

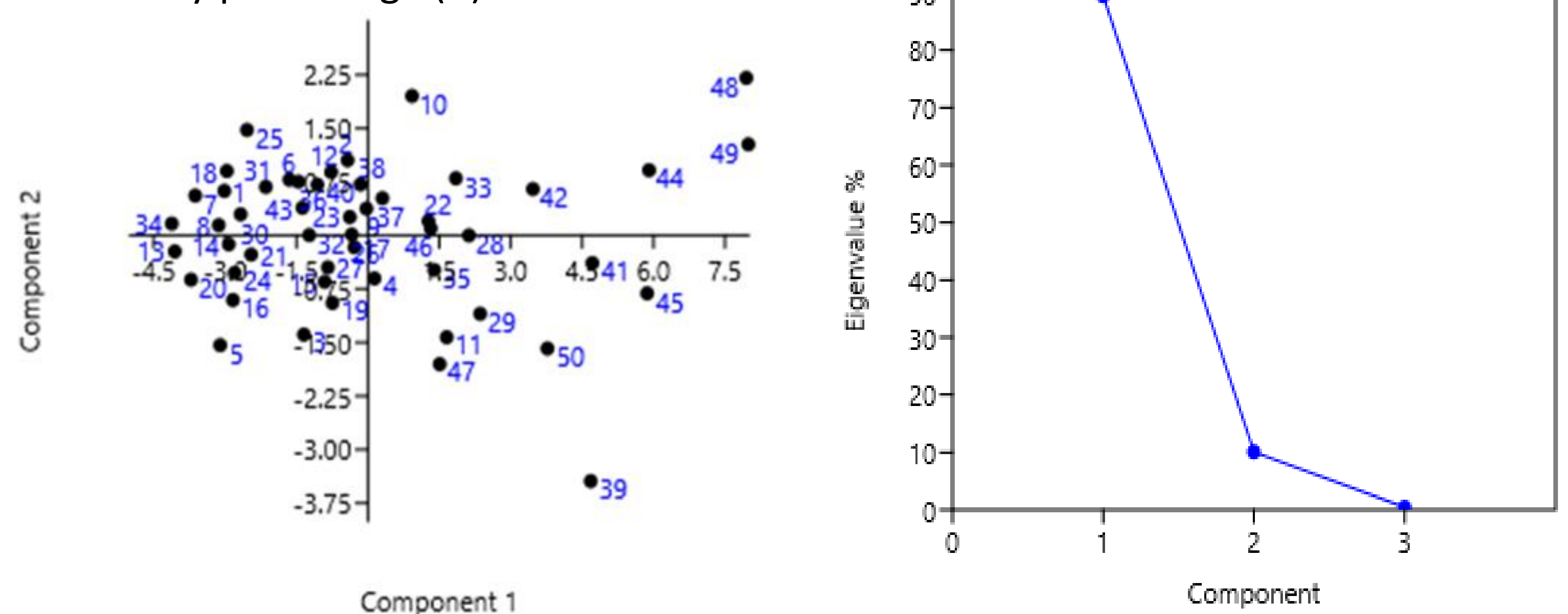
On a sample of 50 acorns per mother tree, the length, width and acorn weight were measured. The derived values were volume and acorn shape index.

## Results

Trait	Mean	Min	Max	SD	CV
Length (mm)	24.7	16.9	40.2	3.5	14.2
Width (mm)	14.5	10.2	31.3	1.9	13.0
Mass (g)	3.3	0.0	20.7	1.4	41.9
Shape index	1.7	0.8	3.0	0.2	12.8
Volume (mm <sup>3</sup> )	4260.4	1672.1	19563.7	1698.6	39.9

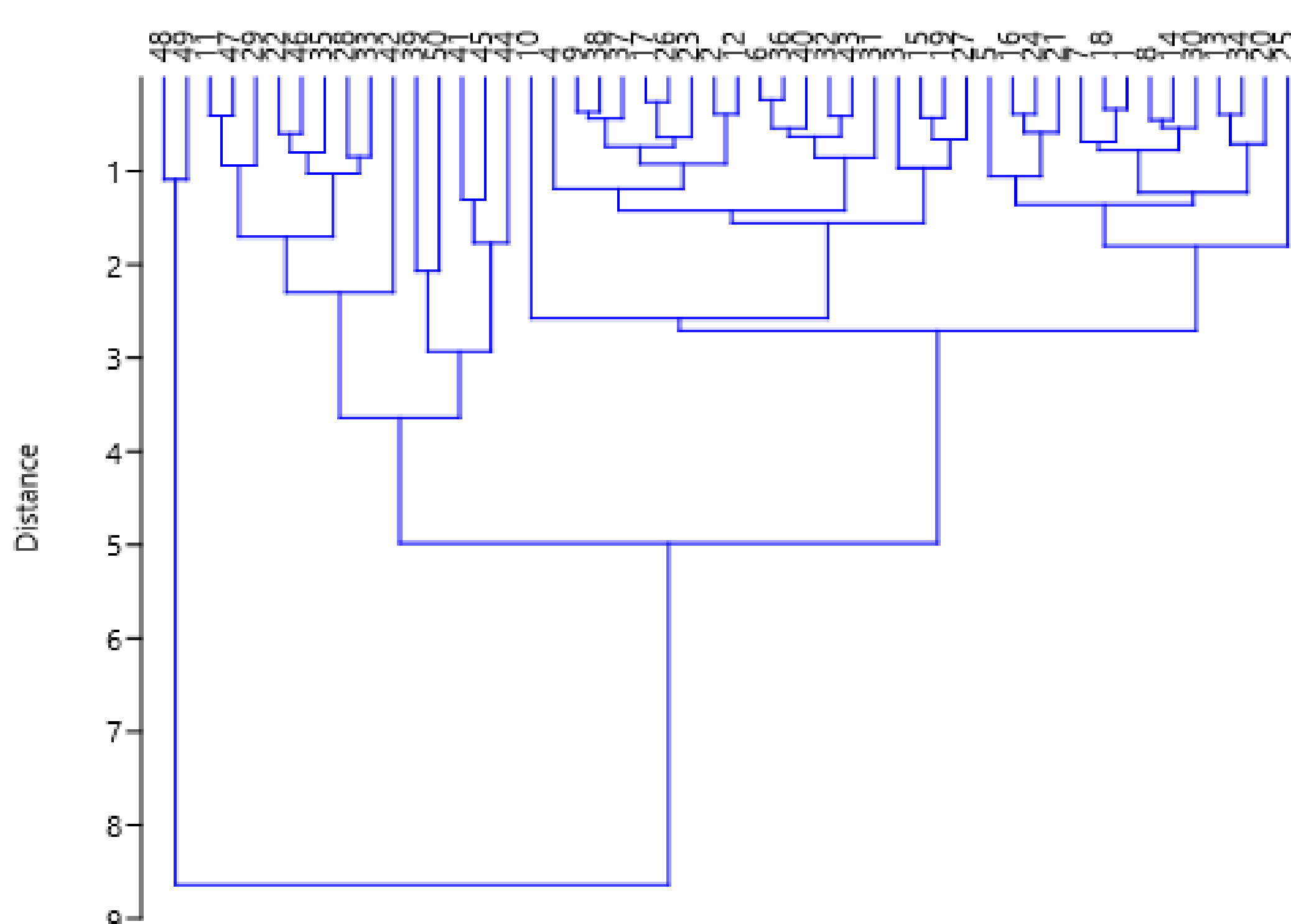
**Table 1** Descriptive statistics of the measured acorn characteristics.

**Figure 1.** PCA biplot presenting the first two main axis components for sessile oak acorn morphological traits (A); all five main components values with cumulative variability percentage (B).



Parameter	SS Effect	df Effect	MS Effect	SS Error	df Error	MS Error	F	p
Acorn length	11203.2	49	228.6	7239.1	1450	5.0	45.8	0.0000
Acorn width	2550.2	49	52.0	2836.8	1450	2.0	26.6	0.0000
Acorn mass	1417.07	49	28.92	1501.46	1450	1.04	27.93	0.0000
Shape index	34.400	49	0.702	36.887	1450	0.025	27.6	0.0000
Acorn volume	2.336252E+09	49	4.767862E+07	1.988823E+09	1450	1.371602E+06	34.76	0.0000

**Table 2** The analysis of variance for measured morphometric characteristics of acorn.



**Figure 2.** Dendrogram presenting 50 sessile oak test trees grouping based on an acorn morphological traits.

## Conclusion

- The average values of morphological traits indicate high variability between the examined genotypes and are confirmed by analysis of variance.
- The available sessile oak genepool is characterized by satisfying level of genetic variability.
- The obtained results should be accepted as preliminary ones, which can serve for forming adequate protected natural good management plans, with the aim of long term preservation and progress of ecological adaptability and evolutive potential of sessile oak population.