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STUDY OF VARIABILITY FOR YIELD COMPONENTS IN SOME
POPCORN (*ZEAMAYS*, VAR. EVERTA) GENOTYPES



"Young people and multidisciplinary
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Abstract: The objective of this study was to evaluate genetic variability based on the ear traits of 5 popcorn genotype (*Zea mays* var. *everta*) to be used in breeding programs. The genotype with the largest ear diameter was Pc3 (34.07mm), and the smallest ear diameter was recorded at Pc4 (31.37mm). The genotype with the highest number of grains per ear was Pc4 (326.52). The weight of the ear was 75.54 (g) and three of the genotypes exceeded the average weight for this character (Pc1, Pc2, Pc4). The genotypes with the highest percentage of grains per cob were Pc4 and Pc5. Based on ear traits, genotypes Pc4 and Pc5 showed 90% similarity and were located in the same cluster as genotype Pc1, which showed 80% similarity with them.

Introduction

Maize (*Zea mays* L.) is the 3rd most significant cereal crop after wheat and rice in the world. Popcorn (*Zea mays* L. *everta*) is an important plant whose economic value is increasing day by day, as it is used in human nutrition as well as in animal feed and industry. Popcorn is the most well-known subtype of corn used in making snack. It is mostly grown in hot and tropical climates. It matures at high temperatures. There are 3-5 cobs on the plant. The grain color can be yellow, Considering the characteristics of ear traits, it was observed that the ear length ranged from 126.5 mm at Pc3 to 152.5 mm at Pc1. The average character size was 139.4 mm. Compared with the average, the genotypes white or purple. More yellow and white are preferred. After the grain matures, water remains in the endosperm, and this causes an explosion when the water is exposed to high temperature. Due to the vitamins and minerals, it contains, popcorn is a preferred food item in terms of nutrition. The popcorn plant can be used in animal nutrition as green fodder, dry fodder and silage. Popcorn have been suggested as alternative silage crops.

Material and method

This study was conducted during 2024. The experimental field was located in Lugoj area where the climate in this year varied from arid to semi-arid. The biological material was represented by 5 popcorn genotypes. The characteristics of the ear were analyzed for these genotypes (ear length, ear diameter, grains number/ear, ear weight (g), cob weight (g), grains weight/ear (g), grains-ear ratio (%), TGW). The results obtained were statistically processed. An analysis-of-variance (One-Way ANOVA) was performed to evaluate statistically differences between results. Means of the data obtained from research were compared using Duncan test at $P \leq 0.05$



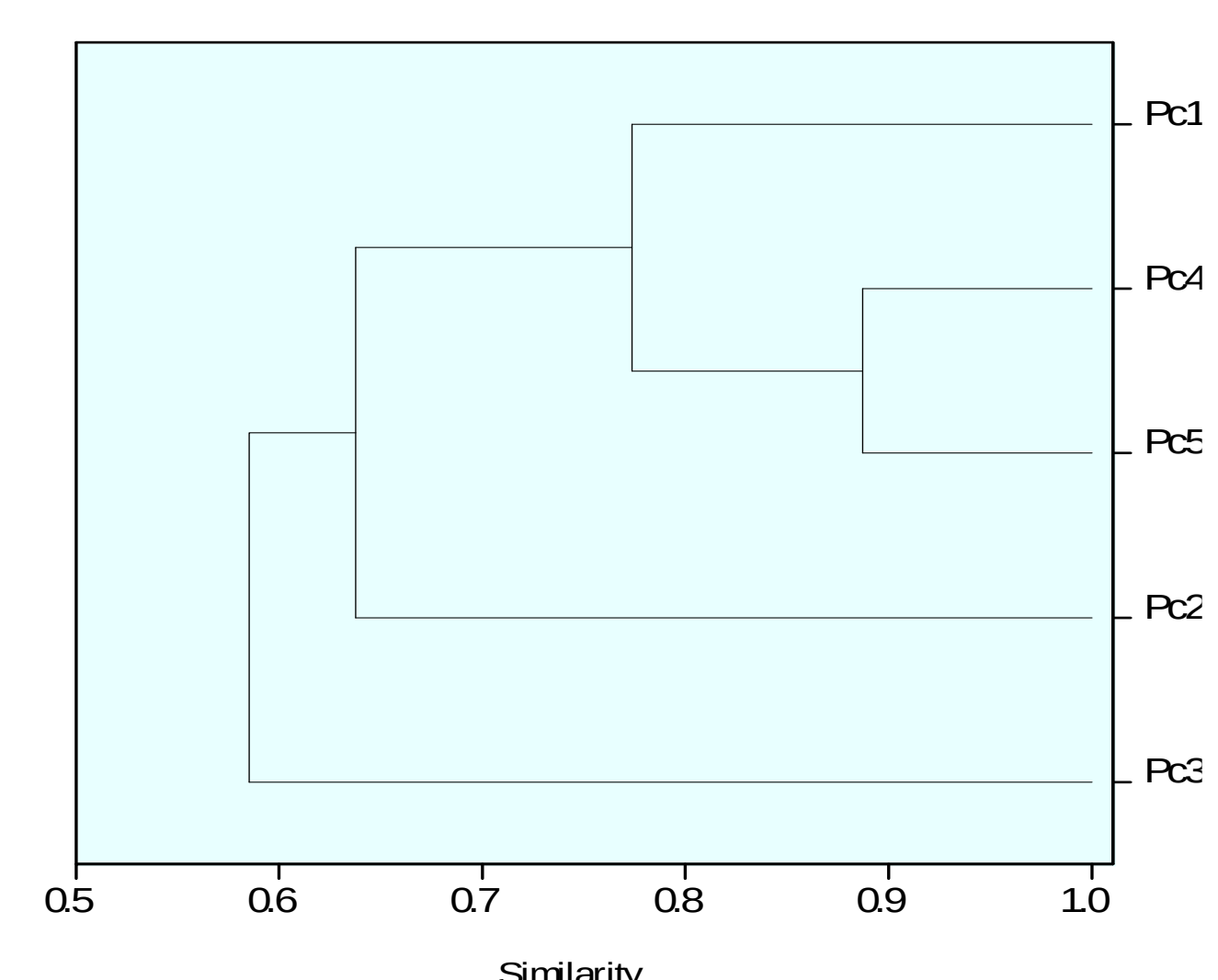
Results and discussions

Pc1 and Pc 2 were superior. The average ear diameter was 32.61 mm. The genotype with the largest ear diameter was Pc3 (34.07mm), and the smallest ear diameter was recorded at Pc4 (31.37mm). The genotype with the highest number of grains per ear was Pc4 (326.52), whereas genotype Pc3 recorded the lowest number of grains per ear (281.67). In the genotypes analyzed, the weight of the ear was 75.54 (g) at Pc3 and 89.37 (g) at Pc2. The average value for this character was 81.14 (g), and three of the genotypes exceeded the average (Pc1, Pc2, Pc4). The weights of the cob were 16.58 g at Pc5 and 25.68 g at Pc2. The genotypes Pc1 and Pc2 were recorded above average. For the weight of grains per ear, an average value of 61.31 g was recorded, with values between 56.45 g at Pc3 and 63.69 g at Pc2. The genotypes with the highest percentage of grains per ear were Pc4 and Pc5.

Values of ear traits in pop corn (*Zea mays* L. var *everta*) genotypes

Genotypes	Ear length (mm)	Ear diameter (mm)	Grains number/ear	Ear weight (g)
Pc1	152.5±4.9 a	32.30±0.75 ab	321.14±5.21 a	81.13±9.61 ab
Pc2	144.1±8.5 ab	33.13±2.50 ab	300.67±25.83 ab	89.37±8.33 a
Pc3	126.5±6.2 c	34.07±1.24 a	281.67±5.70 b	75.54±3.03 b
Pc4	136.9±4.7 bc	31.37±0.76 b	326.52±13.64 a	80.63±8.47 ab
Pc5	136.4±2.3 bc	31.38±1.45 b	301.61±24.78 ab	79.06±8.12 ab
Mean	139.4±3.1	32.61±0.66	306.33±7.88	81.14±3.21
LSD _{5%}	15.1	2.56	38.19	13.22
Genotypes	Cob weight (g)	Grains weight/ear (g)	Grains-ear ratio (%)	TGW (g)
Pc1	20.13±1.19 ab	61.07±7.81 a	73.55±4.60 a	188.55±10.58 b
Pc2	25.68±2.80 a	63.69±2.07 a	72.46±6.75 a	215.26±17.37 a
Pc3	19.09±1.85 ab	56.45±1.29 a	74.98±3.01 a	200.95±13.29ab
Pc4	17.69±1.40 b	62.94±6.07 a	78.74±6.19 a	192.70±18.16 b
Pc5	16.58±1.70 b	62.48±5.52 a	78.91±2.67 a	212.71±9.81 a
Mean	19.84±2.03	61.31±2.57	75.73±1.94	202.04±7.59
LSD _{5%}	7.59	13.10	11.06	18.29

From the dendrogram it can be seen that the genotypes, based on the ear traits, were divided into 3 clusters, the first cluster includes the genotypes Pc4 and Pc5, which show a similarity of 90%, and the genotype Pc1, which shows a similarity to them of 80%. Cluster 2 included genotype Pc2, which was 65% similar to the genotypes in the first cluster. Genotype Pc3, which was located in the third cluster, exhibited a similarity of approximately 60% with the genotypes of the other 2 clusters.



Conclusions

The Pc3 genotype presented the largest ear diameter (34.07mm), and the smallest ear diameter was recorded at Pc4 (31.37mm). The Pc4 genotype registered highest number of grains per ear (326.52). The (Pc1, Pc2, Pc4)genotypes exceeded the average of weight of the ear 75.54 (g). The Pc4 and Pc5 genotypes presented the highest percentage of grains per ear. Based on ear traits, genotypes Pc4 and Pc5 showed 90% similarity and were located in the same cluster as genotype Pc1, which showed 80% similarity with them.