

VARIABILITY OF SOME APRICOT VARIETIES AND HYBRIDS QUALITY TRAITS CREATED IN ROMANIA

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Abstract

*Current requirements of the species *Prunus armeniaca* in terms of creating new varieties are required to conduct extensive research in the apricot breeding program in the southeastern Romania. It's been proceeded to early selection based on correlations in order to create new varieties with high productivity and organoleptic qualities. Characteristics and traits of the 36 varieties and hybrids studied, grouped according to the period of maturation, were studied starting with the IPGRI descriptors used in Genus *Prunus*. The characteristics were followed: fruit weight (g), fruit color, fruit shape (index), fruit firmness (kgf/cm²), dry matter content (%), titratable acidity (malic acid g%) and ascorbic acid content (C vitamin mg/100g). The resulting correlations between quality characteristics to base the selection criteria, in an early stage as the goal being to shorten it and choosing the best varieties.*

INTRODUCTION

The creation of varieties with different fruit maturation periods, with high organoleptic qualities, has been a priority since 1980 to improve the program in Romania.

The market demand for extra early apricots, until recently satisfied by importing them from Mediterranean countries like Italy, France, Spain, Turkey, is a strong argument for the scientists involved in the improvement of this species.

MATERIAL AND METHODS

The biological material is represented by a total of 33 phenotypes of apricot and 3 control varieties, phenotypically grouped by period of fruit ripening: extra early, early, middle and late.

Specific methods were applied regarding fruit quality: fruit weight (g) using IPGRI Descriptors, skin color using the Ctifl color code, fruit shape (index), fruit firmness (kgf/cm²), dry matter content (%), titratable acidity (malic acid g%) and ascorbic acid content (C vitamin mg/100 g).

For a more objective interpretation, the results were statistically processed using statistical software, obtaining the coefficient of variability analysis of variance to express the variability in the character analysis.

RESULTS AND DISCUSSION

VARIABILITY QUALITY PROPERTIES OF APRICOT PHENOTYPE

► Average weight of the fruit

→ The highest average fruit weight are phenotypes: 85.4.104 BIII – Viorica and 77.4.73 BIII – Carmela.

→ Significant differences resulted between early phenotypes group (72.74 g) and medium (69.85 g) than that of phenotypes extraearly (58.6 g), but not to the late (64.67 g).

→ The coefficient of variability (16.21%) expressing a low-medium variability average weight of the fruit.

► Fruit shape

→ The highest shaped index values are the phenotypes: 82.32.29 BIV and 82.6.62 BIV - Siret, the appropriate index elongated shape, while at the other to indicate a value close to the corresponding spherical-shape is flattened and even spherical phenotypes: 85.3.100 BIII, 85.5.100 BIII, 85.5.104 BIII, 85.4.104 BIII – Viorica, 83.31.10BI – Bucovina, Dacia – Mt. and 85.1.96 BIII – Nicușor.

→ The coefficient of variability 7.07% indicates a small variability of the character in the statistical population.

► Skin color of the fruit

→ 77.4.73 BIII – Carmela is the most colorful phenotype, followed by 85.4.104 BIII – Viorica and Dacia Mt., then groups of phenotypes that have the same background color of the skin, thus being assured of significant differences between the phenotypes studied.

→ Significant differences resulted between the classes of maturation studied: the most intense skin color (orange) belonging to the early group (average 6.58), the late (average 5.92 - yellow orange) and extraearly (5.00 - yellow).

→ The coefficient of variability 12.96%, indicating a small - middle variability of the character in the statistics population.

► Firmness of the fruit

→ The phenotypes most firmness are: 85.8.88 BIII – Alexandru, 83.25.9 BI – Andrei, 83.25.23 BI – Atractiv and 82.15.10 BIV – Adina, all having an average indicator of the quality of the fruit of over 3 kgf/cm². Phenotypes most strongly are all having an average indicator of the quality of the fruit of over 3 kgf/cm². 16 of

the 36 phenotypes studied between 1.5 and 2.0 kgf/cm², corresponding to a moderate firmness.

→ Significant differences are statistically assured of maturation between the classes as follows: late phenotypes have the highest fruit firmness of fruits (2.42 kgf/cm²), followed by early grades (1.75 kgf/cm²) and average (1.76 kgf/cm²) with a medium firmness and soft extratimpurii strongly (1.38 kgf/cm²).

→ The coefficient of variability 35.32% indicating a high variability of the character in the statistical population.

► **The dry matter content**

→ The phenotype: 85.11.95 BIII, 85.4.104 BIII – Viorica, 77.4.73 BIII – Carmela, have the highest content of dry matter. 50% of the phenotypes studied have a gradually average dry matter content over 18%.

→ The coefficient of variability 12.86% indicates a low-average variability within the population statistics.

► **Titrateable acidity (malic acid g%)**

→ The lowest malic acid content were: 85.4.108 BIII, 85.2.89 BIII, Dacia Mt. and 85.5.104BIII up to 1.2 g%. Had the highest content of 2.5 g%: 85.5.100BIII, followed a significant Favorite Mt. 2.0 g% and then Excelsior Mt. 1.9 g%.

→ The result was a significant difference between the phenotypes of late maturation class (1.65 g%) than extraearly (1.27 g%). Statistical differences uninsured to meet the early (1.54 g%) and medium (1.43 g%).

→ The coefficient of variability 18.24% indicates a medium variability in the population statistics.

► **Ascorbic acid content (C vitamina mg/100 g)**

→ The phenotypes with the highest content of ascorbic acid (Vitamin C mg/100 g) are: 77.4.73 BIII – Carmela, Dacia Mt., 82.15.10 BIV – Adina, 83.31.10BI – Bucovina, Excelsior and 85.4.104 BIII – Viorica.

→ The significant differences between the classes of maturation are: late phenotypes (15.49 mg/100 g.), early (15.3 mg/100 g.), extraearly (15.10 mg/100 g.) and middle (12.95 mg/100 g.).

→ Variability of ascorbic acid content of fruit had a moderate amount, expressed as the coefficient of variability 17.63%.

Correlations between components of fruit quality

There are strong correlations between:

- the average fruit weight and soluble solids content (Figure 1), the correlation coefficient being 0.6258;
- the average fruit weight and ascorbic acid content (Figure 2), the correlation coefficient is 0.1139;

- the average weight of fruit and fruit skin color (Figure 3), with correlation coefficient of 0.3868.

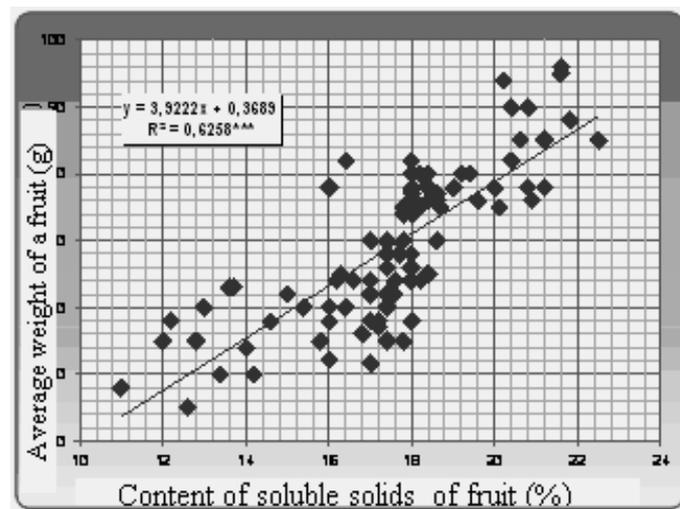


Fig. 1. Intensity correlation between the average weight of a fruit and content of soluble solids of fruits (2001, 2003, 2004)

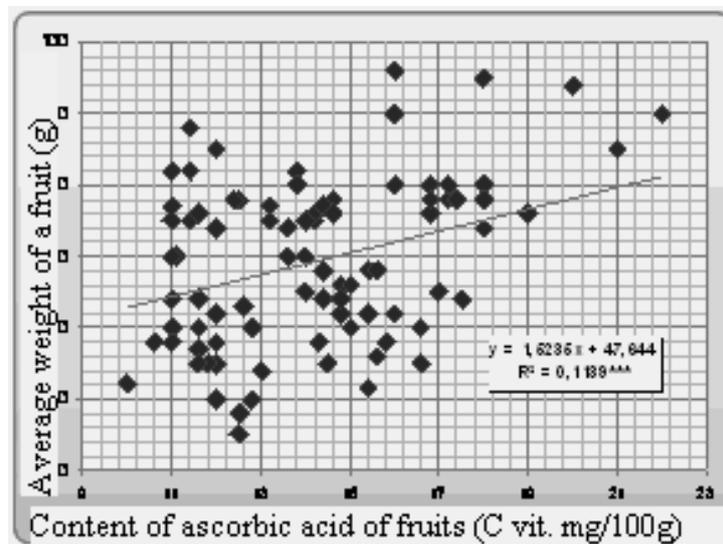


Fig. 2. Intensity correlation between the average weight of a fruit and content of ascorbic acid of fruits (2001, 2003, 2004)

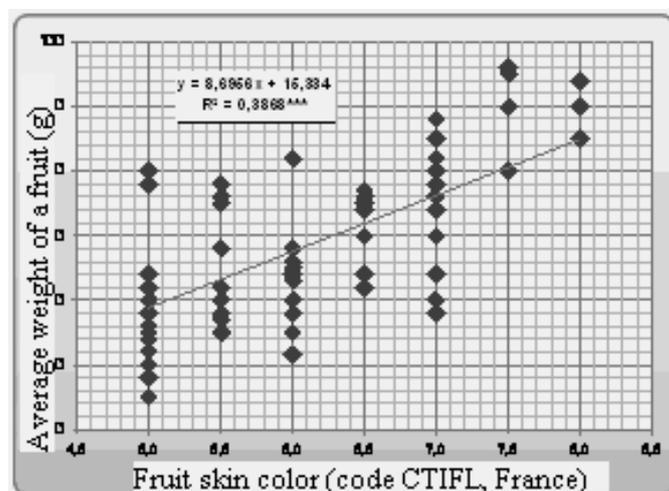


Fig. 3. Intensity correlation between the average weight of a fruit and fruit skin color (2001, 2003, 2004)

CONCLUSIONS

1. The highest average fruit weight are phenotypes: 85.4.104 BIII – Viorica and 77.4.73 BIII – Carmela.
2. The early phenotypes group (72.74 g) have the fruits with the highest weight.
3. The result was a low-medium variability (16.21%) of the average weight of the fruit in the population statistics.
4. Phenotypes with the index close to 1, according to a spherical shape are: 85.3.100 BIII, 85.5.100 BIII, 85.5.104 BIII, 85.4.104 BIII – Viorica, 83.31.10BI – Bucovina, Dacia – Mt. and 85.1.96 BIII – Nicușor.
5. The result was a small variability (7.07%) of the fruit shape in the population statistics.
6. The most colorful phenotype are: 77.4.73 BIII – Carmela, followed by 85.4.104 BIII – Viorica and Dacia Mt.
7. The group of early maturing phenotypes have the most intense color of skin (orange=6.58).
8. The result was a small-middle variability (12.96%) of the skin color in the statistics population.
9. The phenotypes with the most firmness of the fruit (over 3 kgf/cm²) are: 85.8.88 BIII – Alexandru, 83.25.9 BI – Andrei, 83.25.23 BI – Atractiv and 82.15.10 BIV – Adina.

10. The phenotypes with late maturation have the highest fruit firmness of fruits (2.42 kgf/cm²).
11. The result was a high variability (35.32%) of the firmness of the fruit in the statistical population.
12. The highest dry matter content are the phenotypes: 85.11.95 BIII, 85.4.104 BIII – Viorica and 77.4.73 BIII – Carmela.
13. The result was a small-middle variability (12.86%) of the dry matter content in the population statistics.
14. The phenotype 85.5.100BIII have the highest malic acid content (2.5 g%).
15. The phenotypes of late maturation class had the highest malic acid content (1.65 g%).
16. The result was a medium variability (18.24%) of the malic acid content in the population statistics.
17. The highest content of ascorbic acid (Vitamin C mg/100g) are: 77.4.73 BIII – Carmela, Dacia Mt., 82.15.10 BIV – Adina, 83.31.10BI – Bucovina, Excelsior and 85.4.104 BIII – Viorica.
18. The late phenotypes has the highest content of ascorbic acid (vitamin C mg/100 g) (15.49 mg/100 g).
19. The result was a medium variability (17.63%) of ascorbic acid content of fruit in the population statistics.

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