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Varibaility of Quality Indicators in Authoctonus Cultivar Sheshibardhë on Three Defferent Eco- Zones of Albania

ONEJDA KYÇYK[1]*, FATBARDHA LAMÇE[1], KRENAR GOZHDARI[1], JULIAN KARAULLI[1], EDLIRA KUKALI[2]

[1] Faculty of Biotechnology and Food, Food Research Center, Agricultural University of Tirana, Albania

[2] Faculty of Agricultural & Environment, Department of Horticulture & Design Architecture, Agricultural University of Tirana, Albania

Abstract

The study evaluated morphological (skin, pulp and seeds) and chemical indicators of grape berry. The total composition of flavonoids in grains, in the autochthonous vine cultivar Shesh I Bardhe, in three micro areas of Albania (Gjirokaster, Tirana, Durres) was carried out by the spectrophotometric method and was classified as 165.62; 66.36; 183.85 mg/L of gallic acid respectively for different ecoclimatic zones. The sugar content was 13.53 ºBrix per cv Sh. iBardhe, Gjirokastra; 17.5 ºBrix per cv Sh. iBardhe, Tirana and 11 ºBrix by cv Sh. I Bardhe, Sukth.

From the results obtained, it was noted that the effect of the climatic zones, influenced the content of total flavonoids as a result of the different ripening times of the fruit, significant changes were also observed in the morphological indicators of the grape (grain weight, coefficient of construction, weight of 100 grains, husk content, seed content, grain size (length / width), grain index, grain composition coefficient). There is a connection of morphological indicators with environmental factors in the vineyard, recognizing the requirements that the vine plant has four edaphological and climatic factors. It is also worth mentioning the agrotechnical services that are provided to the vineyards, especially fertilization or irrigation, but also the forms of maintenance or pruning, which are crucial factors in the quality indicators of production.

In our study we have only made a definition of physical-chemical quality indicators in three ecozones of Albania, but an in-depth analysis of agrotechnology and beyond should be practiced

Keywords: acidity, brix index, Total flavonoids, grapevine, cv. sheshibardhe.

1. Introduction

SheshiBardhe and *Sheshi Zi* cultivars are the most important varieties for wine production, which is the most important and widely occupancy in these years. The name comes from the hilly village *Shesh* of Ndroq about 15 km near Durres and Tirana too. From here it was distributed in many coastal regions of Albania and represents about 35% of the grapes processed for wine production.

Plants obtained for analysis and description, have represented the basic populations from the stem, for the authentic type of cultivar. They maintain high and stable productivity values. Plants did not show bio morphological defects. They have healthy growth. In general, the trees of the cv. SheshiBardhe have shown many dominant characters in the positive aspect of appreciation.

The genus Vitis L. (Vitaceae) includes about 60 species in the subculture, almost only in the northern hemisphere. Among them the grapevine (V. vinifera L) is the only species widely used in the global grapevine production industry. Apart from the fact that there are thousands of grape cultivars, only a few of them have been used to produce wine. The composition of anthocyanins found in the most famous red grape varieties in the world (cabernet - sauvignon and merlot) (Revilla 2001). In TF (total flavonoids) Tempranillo is the most widely cultivated and analyzed red grape variety (EJ Gonzalez-Sanchez) and moreover there is a large number of articles which speak of anthocyanins in this variety (Downey, MO at al 2004) (KA Roubelakis-Angelakis, 1993). In addition, most of these varieties such as Bobal,

*Corresponding author: Onejda Kyçyk; E-mail: okycyk@ubt.edu.al

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Garnacha, Monastrell, Garnacha Tintorera have been the subject of several studies.

From all these studies it can be seen that there are differences in the compositions of anthocyanins and flavanols among the varieties that may have been used to differentiate one grape variety from another.

2. Material and Methods

2.1Determination of mechanical composition of grapes.

By mechanical composition of grapes, we mean the ratio of parts to components of clothing which are: brakes and grains; while to the grain the ratio pulp, chip, seed. Mechanical analysis includes the following definitions:

Sample weight.

The technical scales carefully weigh the bunch that make up the sample to be analyzed. By knowing the sample weight and the number of bunches we can find the average weight of the bunch

Weight of rachis and berries; The weight of rachis and berries is determined by weighing, in beaker or porcelain capsules, weigh berries and rachis, on electronic scales.

$$Construction\ coefficient = The\ weight\ of\ the\ berries / The\ weight\ of\ rachis$$

Weight of 100 berries; From the mass of berries, they are taken as an average sample of 100 and weighed on technical scales.

The contents of the membrane; Take 100 grape berries and place in the beaker lab. Carefully remove the membrane with tweezers. The skins of 100 grains are collected in capsules or tarred beakers. The mass of the brick is weighed by itself.

Seed content; Determined by squeezing 100 bare berries.

Size of berries; For this purpose, the dimensions of 30 to 40 berries are measured with a ruler or caliber. The average length and width of the berry is considered as the size. Number of berries in 100 gr of grapes of berry index. Weigh 100 g of grape berries accurately on a technical scale and determine their number.

The berry composition coefficient is expressed by the ratio:

$$K2 = (\text{Weight of 100 berries}) / (\text{Weight of 100 berries} + \text{weight of 100 berries})$$

The coefficient of the structure is expressed by the ratio:

$K2 = Pulp\ weights / Bons\ weight$ *(membrane + rachis)*

2.2 Determination of total polyphenols index (TPI).

The total polyphenols index was determined by Cetó et al.; 2012 it is a spectrophotometric method. Samples were diluted and the absorbance was measured at 280 nm, characteristic of benzoic acid present in all polyphenols. The samples were analyzed in triplicate

2.3 Determination of total flavonoid contents (TF).

The total flavonoid content was determined by spectrophotometric method (Zhishen et al., 1999). This method based on the formation of complex flavonoid-aluminum. At 510 nm was measured the absorbance. The concentration of the total flavonoid compounds in the wines was expressed as catechin equivalent (mg/L). The samples were analyzed in triplicate.

2.3 Determination of color intensity.

Chromatic characteristics of the wines were determined by spectrophotometric method. The color intensity was calculated as the absorbance measured at 420 nm. The color intensity assessment refers to the numerical value determination of the white wine chromatic characteristics (Becchetti, 1999). The samples were analyzed in triplicate.

3. Results and Discussion

3.1 The chemical and physical indicators on our study were determine by values specifics that describe the ANOV, JMP analyses such as below

From the early stage to the middle of the period when temperatures rise, ripening on the grapevine continues to cv. *SheshiBardhe* up to 8-10 days before harvest, at the same time this period may have made the difference of the indicators taken in bunch, respectively Weight of bunch, Construction coefficient; Color intensity; % of sugar or even total acidity.

There was also a decrease in the rate of flavonoid synthesis in the cv. *SheshiBardhe* in Tirana about

66.36 compared to the other two macro cultivation areas, which are taken in the study.

Production and bunch in correlation with chemical indicators, of cv. *SheshiBardhe*

Positive values show pairs of means that are significantly different.

Tirana / SheshiBardhe, Durres presented a significant difference of this search indicator in cv SheshiBardhe.

Impact of daily temperature change on the development of grape bunches

The purpose of this study was to determine the effect of temperature on the accumulation and composition of IPT (Total Polyphenols Index) and physical qualities in grape berries grown on cv SheshiBardhe. Temperature had noticeable effects on vesicle growth.

There were significant differences in basic fruit qualities between eco-zones in harvest productions of cv. SheshiBardhe grapes in 2018 (Table 1,2,).

Production in the Durrës area resulted in berry size larger than Tirana and Gjirokastra. IPT (Soluble Solids) and total acidity of Durrës grapes were significantly lower than those of Tirana and Gjirokastra grapes.

In the growing season, the percentage of sugar in the cider of the grapes of cv. *SheshiBardh*, can only reach 11-17°Brix (One-degree Brix is equal to 1 gram of sucrose in 100 grams of solution, which is equal to 1% Brix. Therefore, there is no difference between them: In this case 1 Brix = 1% Brix (weight / weight). A Brix meter / Refractometer is the simplest and most accurate tool to measure Brix).

So, the variations for IPT did not have big differences, Gjirokaster, Tirana, Durres respectively 12.7; 14.3; 12.2, while in terms of TF (total flavonoids) we had new and interesting results in the flavonoid content of berry husk for grapes of the same genetic origin between three different growing areas in Gjirokastra and Tirana, with values of 165.62; 66.36; and 183.58.

Grape berry growth is also sensitive to high temperatures as shown by Matsui et al. (1986) The diameter of grape grains slowed when treated at high temperatures. However, although the diameter of the berry of cv *SheshiBardhe* was not analyzed in our study, but nevertheless in measurement the width of the berry of the grape during the harvest were similar (12.5 ± 0.2) between the study areas.

This is highly consistent with the temperature dependence of photosynthesis of cv leaves. SheshiBardhe, which decreases significantly above 35°C (Kycyk et al 2020).

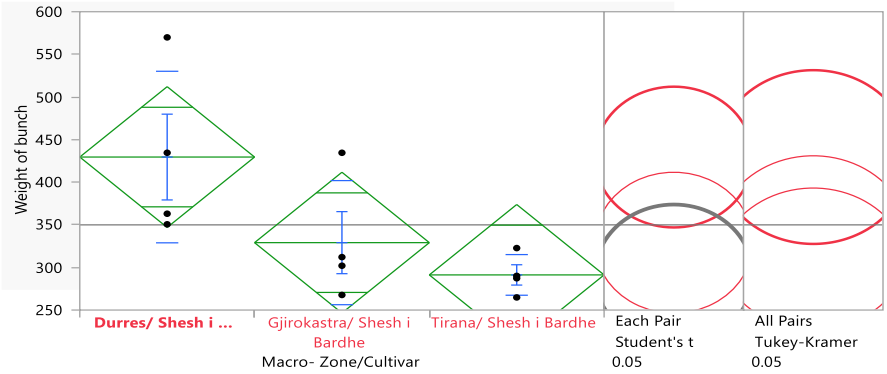

Figure 1. Analyse of variability of value of bunch of in three areas

Tabela 1. Standard deviation and homogenies groups for indicator like weight of bunch in three areas

Level			Mean	t	Alpha
Durres/ SheshiBardhe	A		429.50250	2.26216	0.05
Gjirokastra/ Shesh I Bardhe	A	B	329.07500		
Tirana/ Shesh I Bardhe		B	291.22500		

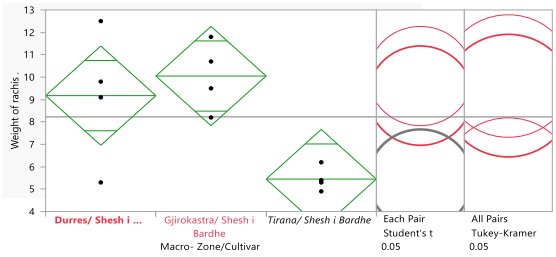

Figure 2. Analyses of variability of values of weight of rachis in three zones of study

q*	Alpha
2.79201	0.05

Table 2. Analysis of Variance Testi fisher

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob > F
Macro-Zone/Cultivar	2	47.735000	23.8675	6.2141	0.0202*
Error	9	34.567500	3.8408		
C. Total	11	82.302500			

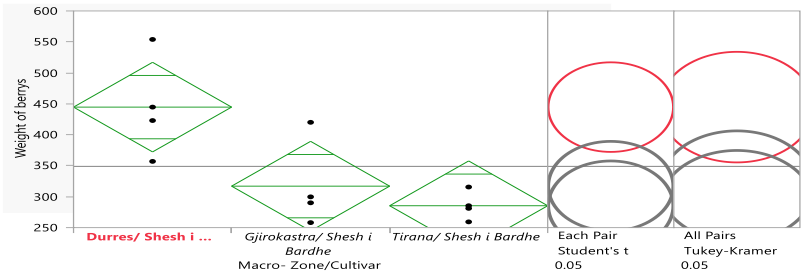

Figure 3. Analyses of variability of value of weight of berries in three zones of study

q*	Alpha
2.79201	0.05

HSD Threshold Matrix

Abs(Dif)-HSD

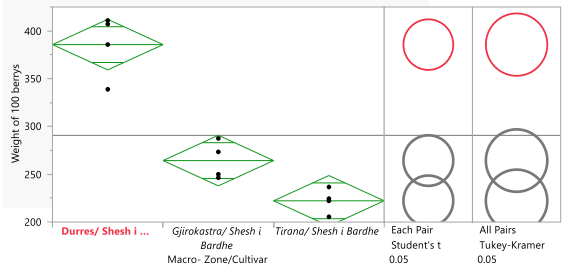

Figure 4. Variability of values of 100 berries in three zones of study

4. Conclusions

- High temperatures in the growing season 2018 in the growing regions of the autochthonous variety SheshiBardhe in Tirana, Durrës, Gjirokaster, Albania were kept for a particularly long period at the time of ripening and this affected the indicators taken in the study (qualitative and quantitative).
- High temperatures and radiation caused the berries of cv. SheshiBardhe to have a good weight ratio of bunches and rachis in the Durres area with 455.8 to 9.2 (rachis), but also contributed to having a low percentage of sugar in this area 11.2%
- This indicator was noticed to be higher in Paskuqan, Tirana with 17.5% in the cider of cv grains. SheshiBardhe
- Seasonal changes in air temperatures had an unlimited effect on the biosynthesis of TF which decreased with increasing temperatures in the area of Tirana, with 66.6 TF (total flavonoids) 183.58 Kulle, Durres and 165.62 in Humelize, Gjirokastra. Color intensity 0.62 Tirana, 1.2 Gjirokastra and 1.48 Durres.

5. Acknowledgements

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