

ASPECTS CONCERNING THE QUALITY OF SOME CHERRY TREE FRUITS RIPPED IN THE CLIMATIC CONDITIONS OF 2010 FROM NORTH-EASTERN ROMANIA

INVESTIGAREA CALITĂȚII FRUCTELOR UNOR SOIURI DE CIREȘ ÎN CONDIȚIILE CLIMATICE ALE ANULUI 2010 DIN ZONA DE NORD-EST A ROMÂNIEI

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Abstract. Cherry fruit quality is given by several indicators (color, firmness, sugars etc.). In this paper we determined the dry weight, acidity and soluble carbohydrates of 16 varieties of sweet cherry fruits with different maturity periods which are destined for fresh consumption and for industrialization in the food industry. Our results may indicate the suitability of the area (North-East Romania) for a large-scale cultivation of these varieties, since some are new varieties approved in the last 5-6 years and others imported varieties, which are not found in big tree orchards in this region. The soluble carbohydrates quantity has been determined to be between 12,69 - 19,58 % and the acidity of the fruits was in the interval 4,8 - 8,64 g/L (expressed in citric acid).

Key words: *Prunus avium*, soluble carbohydrates, acidity

Rezumat. Calitatea fructelor de cireș este dată de mai mulți indicatori (culoare, fermitate, cantitatea de zaharuri, etc.). În aceasta lucrare am analizat conținutul de substanță uscată solubilă, cantitatea de glucide solubile și aciditatea fructelor la 16 soiuri de cireș cu perioade diferite de maturitate care sunt destinate atât consumului în stare proaspătă, cât și în industria alimentară. Determinările efectuate ne pot indica propicuitatea zonei (Nord-Estul României) în vederea cultivării la scară mare a acestor soiuri, având în vedere că unele sunt soiuri noi, omologate în ultimii 5-6 ani, iar altele sunt soiuri importate care nu sunt extinse în cultură în această zonă. În ceea ce privește cantitatea de glucide solubile, aceasta a fost cuprinsă între 12,69 și 19,58 %, iar aciditatea a avut valori între 4,8 și 8,64 g/L (exprimat în acid citric).

Cuvinte cheie: *Prunus avium*, glucide solubile, aciditate

INTRODUCTION

The cherry tree is one of the most important fruit bearing trees from the temperate area. Its fruit are appreciated mainly based on their weight and sugar content, and also due to the fact that in some areas, they are the first fresh fruit of the year. The colour of the fruit is the most important quality and maturity indicator the cherries, and depends on the anthocyan content (Esti et al., 2002), this is why we have selected varieties with fruit of different colours. Another characteristic we have taken into consideration for our study has been the total acidity of the fruit. Cherries are the fruit with the highest average total sugar content (glucose, levurose, sucrose), while

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its acidity covers an intermediary position. The fruits were harvested at commercial maturity based on color and organoleptic characteristics

MATERIAL AND METHOD

In our study, we have included the fruit of 16 cherry tree varieties. Of these 11 varieties have fruit with red epidermis (Tereza, Lucia, Izverna, Grosse Schwarze, Cătălina, Cetățuia, Radu, Windsor, Lambert, Oana, Ștefan), 2 have bicolour epidermis (Marina and Vega – figure 3) and one is yellow with a colourless juice (Big Drogan). At the same time we have analyzed two types of sour cherry trees: Amar de Galata and Amar de Maxut (figure 2).

In order to determine the soluble carbohydrates quantity in the fruit, we have employed the *School Method* as modified by Vlad Artenie. The soluble dry substance has been determined using the refractory-metric method for the fruit juice.

The total acidity of the analyzed samples has been established using the *potentiometric method*. The juice samples and diluted macerated product have been mixed with a sodium hydroxide solution until they reached 7p.H. The carbon dioxide from the sample had been removed beforehand.

The fruit have been picked as they reached commercial maturity, depending on the color and characteristic organoleptic quality.



Fig. 1 - Lucia



Fig. 2. Amar de Maxut



Fig. 3 - Vega



Fig. 4 - Cetățuia

RESULTS AND DISCUSSIONS

The early fructification of the species *Prunus avium* suggests that a substantial part of the carbohydrates used in the early development phase of the cultures comes from reserves (Roper, Kennedy, 1986).

Even if most carbohydrates are synthesized in the leaves through photosynthesis, some are also produced in other green tissues from cothyledons,

buds, branches, stems, flowers, fruit and cones (Kozłowski, Keller, 1966). Wood plants create carbohydrates reserves when these are excessively produced and use these reserves when the use rate exceeds the synthesis. The deposited carbohydrates play an important role in metabolism, growing, defence, prevention and delay of plant mortality (Kramer, Kozłowski, 1979).

The results of the analysis carried out for the cherry tree varieties have shown differences in the quality of soluble dried substance (S.U.S. %) present in fruit, as well as significant differences of soluble carbohydrates from fruit.

From table 1 we can see that the soluble carbohydrates in fruit varies between 12,69% for Big Drozan, whose fruit epidermis is yellow, and 19,58% for the Lucia variety (figure 1). Higher values have been registered for other varieties such as Grosse Schwarze, Cătălina, Cetățuia (figure 4), and Amar de Maxut, the latter, despite the fact that has sour fruit, has a high level of carbohydrates. Lower values have been registered for Radu, Izverna and Oana.

Table 1

Soluble dry substance content and soluble carbohydrates for the fruit of several cherry tree varieties

Variety	S.U.S. (%)	Soluble carbohydrates (%)
<i>Amar de Galata</i>	17.20	15.48
<i>Amar de Maxut</i>	19.26	17.33
<i>Marina</i>	17.75	15.98
<i>Tereza</i>	15.75	14.18
<i>Lucia</i>	21.75	19.58
<i>Izverna</i>	14.40	12.96
<i>Grosse Schwarze</i>	21.10	18.99
<i>Big Drozan</i>	14.10	12.69
<i>Catalina</i>	20.70	18.63
<i>Cetățuia</i>	20.10	18.09
<i>Radu</i>	14.30	12.87
<i>Windsor</i>	16.50	14.85
<i>Lambert</i>	17.10	15.39
<i>Oana</i>	15.30	13.77
<i>Stefan</i>	18.25	16.43
<i>Vega</i>	17.80	16.02

According to some authors (Serrano et al., 2005; Usenik, Štampar, Šturm and Fajt, 2005) the cherry tree's predominant sugars is glucose.

Regarding the cherry tree, not only the carbohydrates quantity produced and deposited by the cherry tree in different organs and tissues is taken into consideration, but also the sugar quantity stored in the cherries, that represent the main component of the plantation production for this tree species.

The titrable acidity of the fruit juice, the leaves mash etc. measures the titrable hydrogen ions concentration that are contained in the analyzed samples, by neutralizing them with a strong basis solution at a fix pH. Its value contains all substance of an acid nature such as: free hydrogen ions, organic acids, acid salts and cations. Since the organic acid is the main component of the sample that

reacts with the basic solution, the titrable acidity is expressed as g/L or g/100 mL of the main acid. In fruit, citrus cid or malic acid or both predominate.

The total acidity of the fruit variety has been expressed in $\text{g}\cdot\text{L}^{-1}$ citric acid ($\text{C}_4\text{H}_8\text{O}_7$). The fruit have shown acidities between $4.8\text{g}\cdot\text{L}^{-1}$ $\text{C}_4\text{H}_8\text{O}_7$ for the Big Drogan variety and $8.64\text{g}\cdot\text{L}^{-1}$ $\text{C}_4\text{H}_8\text{O}_7$ for Lucia variety.

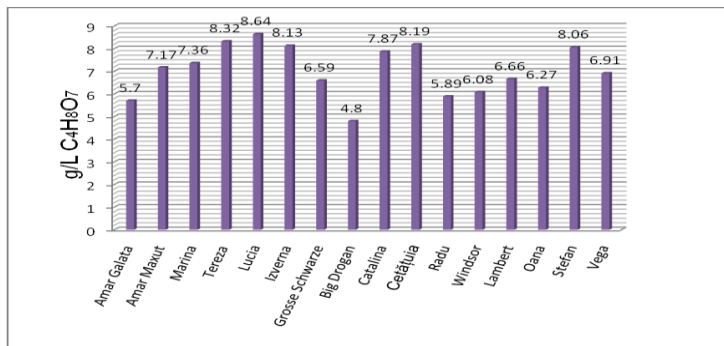


Fig. 5 - Fruit acidity

All the obtained results are presented in figure 5. Low values have been registered for the Amar de Galata and Radu varieties, while higher values have been obtained for Marina, Cetățuia and Izverna.

CONCLUSIONS

1. The values obtained for cherries in 2010 vary significantly among varieties, the lowest values being registered for the Big Drogan variety, while the highest have been registered for the Lucia variety.

2. The value of the total carbohydrates / acidity can be an indicator to evaluate the taste quality of horticultural products, according to this report the studied varieties were evaluated.

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