POLYPHENOL CONTENT EXAMINATION OF TOKAJI ASZÚ WINES

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Abstract

There are two important conditions which determine the nascency of particular Tokaj wines comulatively:

- distinctive savour and fragance called the „aszú" taste and caused by *Botritis c.*
- Tokaj nature which come from the barrel and other special aging methods

We must state that two conditions above are only prevalent in the case when the processed grapes are full or over ripened, besides following the Tokaj wines preparation criterions (grape variety, soil, microclimate, vintage, etc.). These two conditions mentioned before were followed up only sensory based analysis up to now, altough the study of chemical idetified compounds which confirms these are obviuos. This study about the investigatation of the polyphenol compounds biological effect, next to definiate the tirosol, one of the simple phenol content from these wines. The grape stem and wine contents are changing during the infection of *Botritis c.*, also the aminoacid content is decreasing. It is therefore assumed that the Tyrosine content derived from amino acids present in lower concentrations in the Tokaji wines. The *Tyrosol* (*p-hydroxyphenyl ethanol*) belongs to the simple phenols compounds and generated oxidative decarboxylation of the alcoholic fermentation only. It is oenological significance in sensory value itself, because it have a bitter taste, which could give that bitter flavour over 25 mg/l concentration.

Also could be detect a significant differences in the simple phenolic and polyphenolic composition from each vintages at same sugar content level. We continue our investigations worthwhile. It is important to determine the polyphenolic compounds due to their positive health effects and simple polyphenols, including the amount of Tyrosol too, which also keep track of the Tokaj wines.

Keywords: Tokaj, polyphenol, aszú, wines, tyrosol, Botrytis

1 INTRODUCTION

There are two important conditions which determine the nascency of particular Tokaj wines comulatively:

- distinctive savour and fragance called the „aszú" taste and caused by *Botritis c.*
- Tokaj nature which come from the barrel and other special aging methods

We must state that two conditions above are only prevalent in the case when the processed grapes are full or over ripened, besides following the Tokaj wines preparation criterions (grape variety, soil, microclimate, vintage, etc.). These two conditions mentioned before were followed up only sensory based analysis up to now, altough the study of chemical idetified compounds which confirms these are obviuos. This study about the investigatation of the polyphenol compounds biological effect, next to definiate the tirosol, one of the simple phenol content from these wines. The grape stem and wine contents are changing during the infection of *Botritis c.*, also the aminoacid content is decreasing. It is therefore assumed that the Tyrosine content derived from amino acids present in lower concentrations in the Tokaji wines. The *Tyrosol* (*p-hydroxyphenyl ethanol*) belongs to the simple phenols compounds and generated oxidative decarboxylation of the alcoholic fermentation only. It is oenological significance in sensory value itself, because it have a bitter taste, which could give that bitter flavour over 25 mg/l concentration.

2 MATERIALS AND METHODS

Determination of the polyphenolic composition.

- determination of the total polyphenolic content, applying the Folin–Ciocalteau reagent, calibrated to gallus acid,
- the quantity of leucoantocyanins, after heating with a 40:60 compound of hydrochloric acid-butanol containing iron (II) sulphate, spectrophotometrically (FLANZY et al. 1969, modified)

– the catechin content in wine diluted by alcohol, at its reaction to vanillin-sulphuric acid, at 500 nm, spectrophotometrically (REBELEIN, 1965)

The HPLC technique was used to detect tyrosol. During this process, by means of the diode array detector, one has the opportunity to analyse the simple phenolics (cinnamic acid derivatives, such as coffee acid) and their esters formed with tartaric acid (e.g. caftar acid).

TAS-value. The determination of the TAS-value was measured with the help of the Randox-test applied in the medical practice (KÁLLAY, TÖRÖK, 1999).

The sample was diluted ten times with distilled water (in the case of white wines not necessary). 30 cm^3 of distilled water and 0.5 cm^3 of the diluted sample, and 2.5 cm^3 of Folin-Ciocalteau reagent were added to 7.5 cm3 of 20% Na2CO3 solution in 8 minutes time. Adsorbancy inspected at 765nm against to water. The color of the samlple could stable to 25 minutes.

$$\textbf{TAS (mmol/l)}=(20*A_{765})*\textbf{dilution}$$

3 RESULTS AND DISCUSSION

Measurement results were presented in tables and graphs. Figure 1 shows that can not be clearly conclude to the vintage and the aszú content in wines by the results of the unanimous polyphenol composition. As the aszú processing have a so many opportunities inside eg. the exploration aszú berryes with must in fermenting, or with a joung wine.

Our further interest is that certain samples of all polyphenol concentration was significantly different inside in the same year to year, and same sugar content wines. This supports the fact that according the polyphenol conent of the fermenting stum or fresh wine which used for extracting the aszú berries. No significant difference in determining the values of TAS nor the wintage nor the sugar content (Figure 2). There is one of the ten samples which had a higher TAS value (2,5mMol/l). The samples TAS value were visible between 1,5-1,8 mMol/l.

however we want to also, but could not observed higher values as the white wines normal in the resrevatrol concentration (Table 1.). The samples averge resrevatrol concentration were about 1 mg/l. As explained by the grape produce resveratrol in the protective mechanism against microbial infections. Therefore, if the Botrytis takes place, referring to the low concentration of resveratrol presence. The resveratrol in grapevine beta-glycosidic bond, therefore, is only released due to the enzymatic activity of the yeast during the alcoholic fermentation.

According the fresh wine and stum resrevatrol concentration determine also in the aszú berries. This assumption is supported by the measurement result is shown in Figure 3, which according to ß-glucosidase enzyme-treated aszú rezvertarol concentration contain significantly higher concentrations of resveratrol. The simple phenolic composition are summarized in Table 2.

Measurement results show that simple phenolic composition of the aszú wine is not higher than those of whites. Between samples of the same vintage and sugar content wines could be significant difference detected also. Which proves the fact that the content of polyphenols can not be traced universally to sugar content or vintage. In Figure 4 is shown Tyrosol concentration. The measured average compared to historical data (20-30mg / l) Tyrosol lesser extent and also observed a significant difference between the samples. This can be explained in terms of Botrytis occurs in the amount of the reduction in tyrosine. In two five 'puttonyos aszú' of the samples mesaured 30 mg/l higher concentration.

It could be detected a significant differences also in the simple phenolic and polyphenolic composition from each vintages at same sugar content level. We continue our investigations worthwhile. It is important to determine the polyphenolic compounds due to their positive health effects and simple polyphenols, including the amount of Tyrosol too, which also keep track of the Tokaj wines.

4 CONCLUSION

Simple- and total polyphenol compositions were determined from the Tokaji Aszú wines in this study. Nor the polyphenol and the simple phenol composition could diferentiate in our measurements the distinct sugar content Tokaji Aszú wines from each other. Fermenting stum which utilized during the preparation Aszú wines or the fresh wine affect the amount of rezveratrol. The Tyrosol concentration due to Botrytis activity was lower than those of white and red wines. We continue our investigations worthy of further works and vintages.

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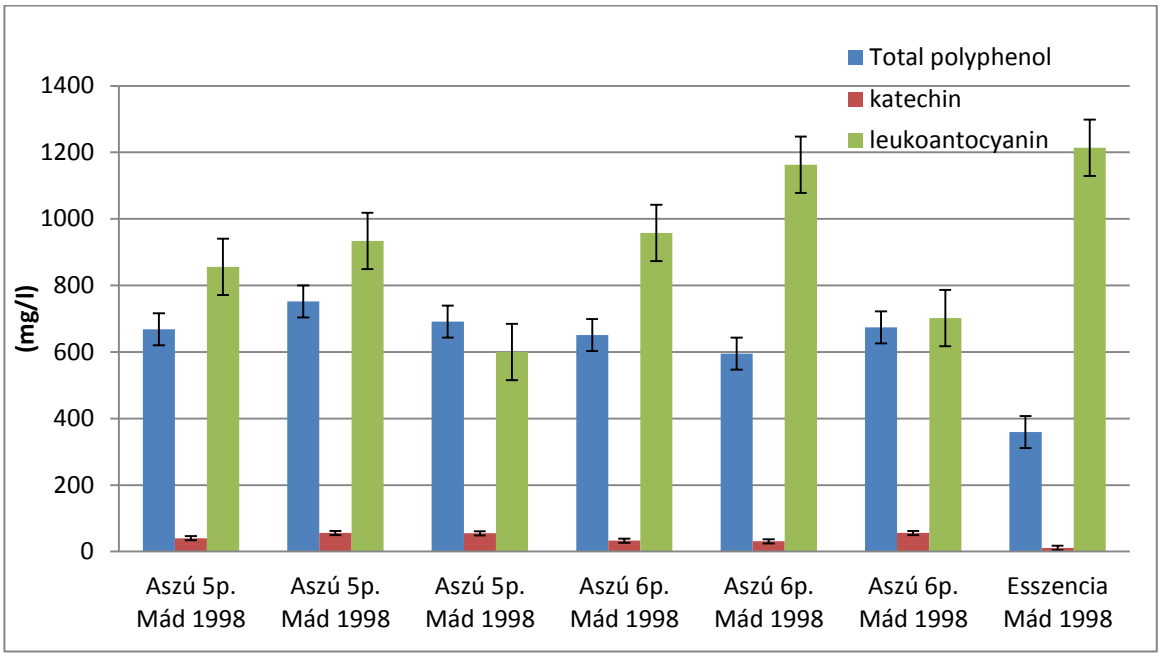

Figure 1. Polyphenol concetration in samples

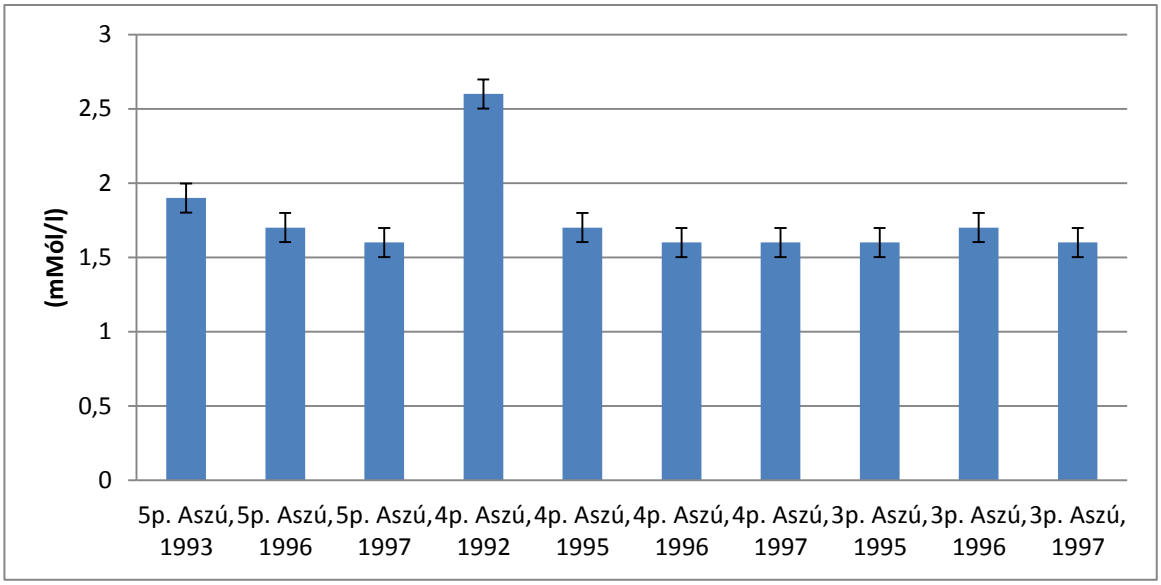

Figure 2. TAS values in samples

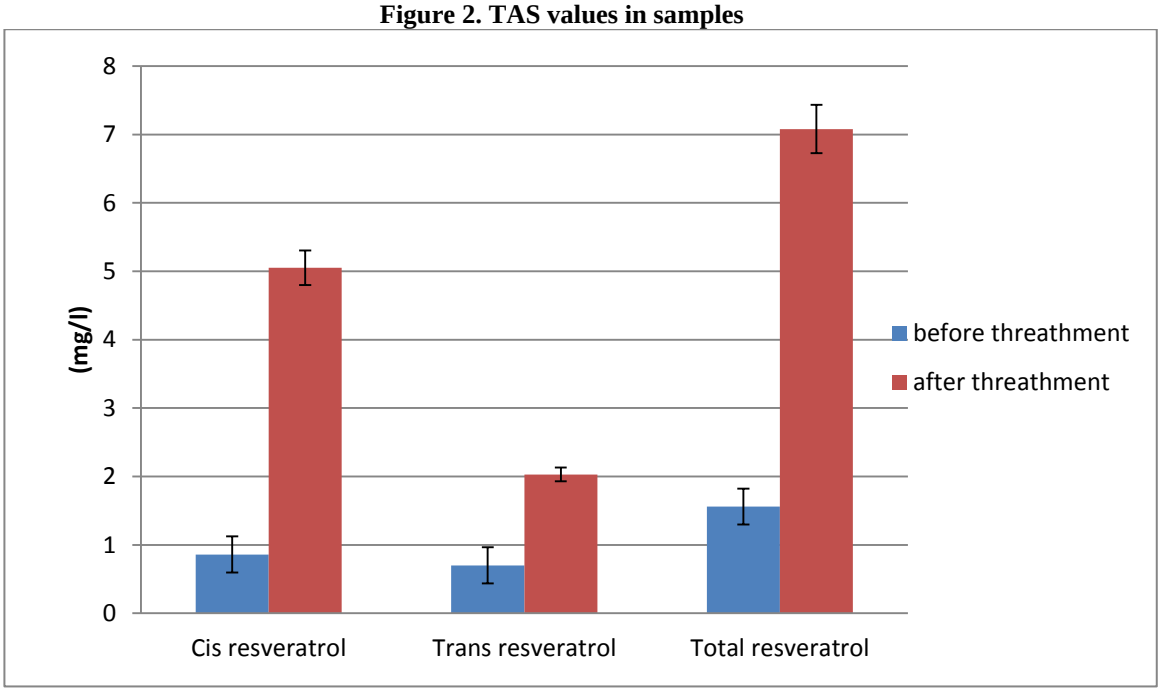

Figure 3. Resrevatrol isomers before and after threathment

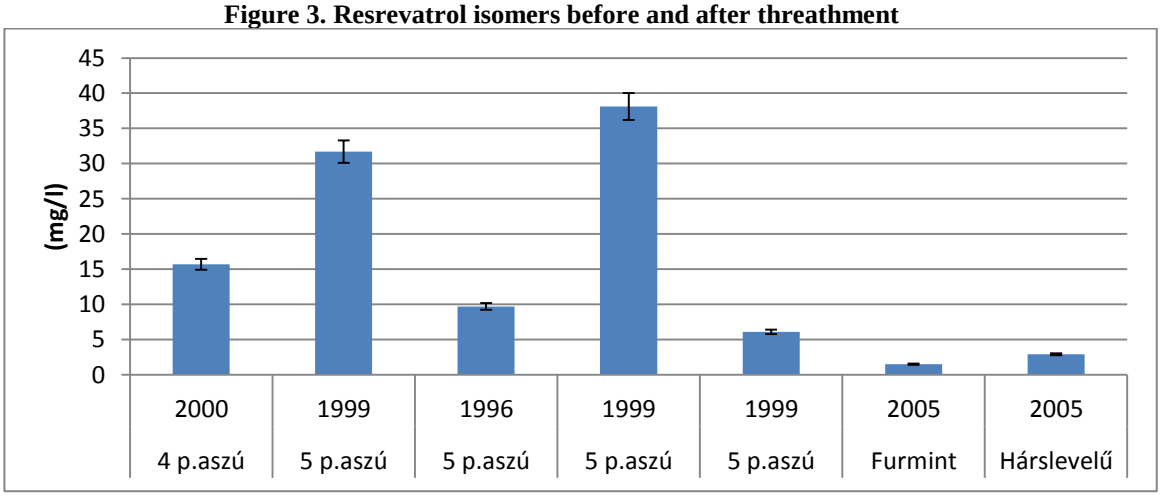

Figure 4. Tyrosol concentration in samples

Table 1. Resrevatrol concetration

	% sample distribution	Concentration (mg/l)
4 puttonyos aszú	36	**0,10-0,15**
5 puttonyos aszú	27	**0,12- 0,24**
6 puttonyos aszú	33	**0,10-0,12**
Sample amount	**39db**	

Table 2. Simple phenolic composition

(mg/l)	**4 p.aszú**	**5 p.aszú**	**5 p.aszú**	**5 p.aszú**	**5 p.aszú**	**Furmint**	**Hárslevelű**
	2000	**1999**	**1996**	**1999**	**1999**	**2005**	**2005**
katechin	32,9	29,4	5,6	54,8	11,2	32,4	8,9
tyrosol	15,7	31,7	9,7	38,1	6,1	1,5	2,9
epikatechin	30,7	62,5	14,7	26,1	13,7	11,8	10,3
GRP	29,9	n.d.	n.d.	4,7	n.d.	2,3	3,5
t-cutaric acid	n.d.	n.d.	n.d.	n.d.	n.d.	9,3	19,3
t-fertaric acid	1,5	5,9	n.d.	3,1	1,8	1	1,5
t-caffeic acid	n.d.	55,8	n.d.	n.d.	n.d.	1,3	5,5
cis-caftaric acid	n.d.	n.d.	n.d.	13,6	7,2	10,2	9,3
trans-caftaric acid	26,4	8,5	n.d.	2	n.d.	18,3	10,5
cis-cutaric acid	n.d.	n.d.	n.d.	n.d.	n.d.	2,5	5,4
t-para-cumaric acid	n.d.	n.d.	n.d.	n.d.	n.d.	4,3	11,5
trans-ferulic acid	n.d.	n.d.	1,2	n.d.	n.d.	1,1	0,7