

ANALYTICAL AND SENSORY EVALUATION OF TWO SLOVAK WINE VARIETIES

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The Slovak wine varieties allowed for wine production are listed in the Common Catalogue of Varieties of Vine. The varieties used for wine production determine the characteristic aromas of the resulting wines. The main objective of this work was to find out how to guarantee a high and homogeneous quality of sensory analyses. These analyses have to be objective, precise and reproducible including the processing of results by our central nervous system. In this work we show how to determine selected wine varieties by sensory analysis carried out by five tasters who were trained and tested in our laboratory according to EN ISO/IEC: 17024. The results show that two main wine varieties from the low Carpathians Region in Slovakia – 'Grüner Veltliner' and 'Traminer rose' must have a stable sensory profile. Wine samples were chosen from the vintages 2009 and 2010 and tasters had to assess their characteristic outer appearance, body, smell and flavour.

Keywords: wine analysis, sensory analysis, wine tasting

Analytische und sensorische Beurteilung zweier slowakischer Weinsorten. Die für die Weinproduktion zugelassenen slowakischen Rebsorten sind im Gemeinsamen Rebsortenkatalog angeführt. Die für die Weinproduktion verwendeten Sorten bestimmen die charakteristischen Aromen der resultierenden Weine. Das Hauptziel dieser Arbeit war es herauszufinden, wie eine hohe und homogene Qualität sensorischer Analysen zu gewährleisten ist. Diese Analysen müssen objektiv, präzise und reproduzierbar sein, einschließlich der Verarbeitung der Ergebnisse durch unser Zentralnervensystem. Diese Arbeit beschreibt die Charakterisierung ausgewählter Weinsorten mittels sensorischer Analyse durch fünf Verkoster, die nach EN ISO/IEC 17024 in unserem Labor ausgebildet und geprüft wurden. Die Ergebnisse zeigen, dass die beiden wichtigsten Weinsorten aus der Region Kleine Karpaten in der Slowakei – 'Grüner Veltliner' und 'Traminer rose' – ein stabiles sensorisches Profil aufweisen müssen. Die Verkoster mussten Weinproben der Jahrgänge 2009 und 2010 hinsichtlich ihrer charakteristischen äußeren Erscheinung, ihres Körpers, Geruchs und Geschmacks beurteilen.

Schlagwörter: Weinanalyse, sensorische Analyse, Verkostung

Many studies have been carried out on sensory analysis and international standards deal with the determination of the sensitivity of tasters in sensory evaluation. ISO is the International Organisation for Standardization and works through several technical committees. For instance ISO 3972:1991 was prepared by the technical committee ISO/TC 34, Agricultural food products, Subcommittee SC 12, Sensory analysis. For assessing the sensory sensitivity of tasters the following indicators were used: sucrose for sweetness, quinine hydrochloride for bitterness and citric acid for sourness (ISO 3972:1991). Our Institute is an accredited organ for the certification of persons who are able to evaluate sensory properties of wine products. This organ is accredited by ISO 17024:2012, which sets out criteria for bodies operating certification of persons; many winemakers, cellar masters and other people in the wine branch have been certified „selected assessor“ or „ assessor-expert“ by our institute. These people were tested in our special sensory laboratory (Fig. 1) under ISO 6658: 2005, ISO 5492: 2009, ISO 3972: 1991 and ISO 8586-1,2: 2008. Description of taste, smell and colour was trained by means of several tests (duo-trio test, triangular test, paired comparison test, comparison test of acids in wine, colour comparison). By these tests tasters also learned to identify aromas and to determine detection limits for sweetness and sourness in wine (ISO 11035:2002, ISO 6658:2005, ISO8586-1,2: 2008).

Five experienced tasters (LAŠTINCOVÁ and MOŠKO, 2014) were involved in establishing sensory profiles of 'Grüner Veltliner' and 'Traminer rose'. A detailed characterization of these two varieties is important for the Slovak wine production. These grapevine varieties are typical for the low Carpathian Region (PDO-Malokarpatský) in Slovakia. The regional character of wines is defined by variety, climate and soil which influence the phenolic as well as the odor-active volatile compounds (ROUJOU-DE-BOUBEE, 1999). Many faulty and main negative attributes of still wines in the odour category are vegetable, mouldy, acetic, reduced, oxidised, animal, and in the taste category acidic and bitter/astringent (RIBÉREAU-GAYON et al., 2004). The tasting panel was able to determine appearance, smell, palate/purity, intensity, flavour, harmony and overall impression.

MATERIAL AND METHOD

DETERMINATION OF THE ANALYTICAL PROFILE

Wine samples were taken from the wine estates intending to establish themselves in the market of exclusive wines, in particular wines with protected designation of origin (PDO in Slovakia) from the low Carpathian Region as wine.



Fig. 1: Sensory analysis: Design of the tasting room

For the determination of alcoholic strength the samples (volume 100 to 150 ml) were neutralised and distilled, then the alcoholic strength was determined by pycnometry. For the determination of total acidity (sample volume 10 to 25 ml) carbon dioxide was removed by vacuum, and potentiometric titration was used with 0,1M NaOH till pH=7 at 20°C. For the determination of volatile acidity (sample volume 10 to 25 ml) steam distillation was applied with KOH for titration and phenolphthalein as indicator. All these analytical methods are in accordance with the commission regulation EEC (No. 2676) 1990 and OIV (Organisation Internationale de la Vigne) methods. Also determination of reducing sugars (EDER and BRANDES, 2003), total extract, extract without sugar, volatile acids and total sulphur dioxide were carried out according to protocols established by the OIV (OIV, 1990). The wine samples were determined as still white dry wines. All analytes were present at natural levels (e. g. sample No 11137: white quality wine 'Grüner Veltliner', vintage 2009: alcohol 13.3 %vol., extract 18.9 g/l, sugar 2.3 g/l, extract without sugar 16.6 g/l, total acidity 5.3 g/l, volatile acidity 0.62 g/l, total sulphur dioxide 105 mg/l; e. g. sample No 11169: white wine 'Traminer rose' from Villa Vino Raca, vintage 2009: alcohol 13.4 %vol., extract 23.0 g/l, sugar 1.5 g/l, total acidity 4.7 g/l, volatile acidity 0.50 g/l, total sulphur dioxide 132 mg/l.

DETERMINATION OF THE SENSORY PROFILE

In the laboratory of wine analysis the five persons with certificate were involved as sensory analysts to make a sensory profile of 'Grüner Veltliner' and 'Traminer rose'. They should identify and select three main descriptors and flavours typical for these varieties. The test was carried out under standard procedure No RSA/DM-01 in accordance with ISO 11035:2002. At first the tasting panel had to taste three samples of 'Grüner Veltliner', vintage 2009 and/or 2010, and to determine selected flavours which are characteristic for this variety. Then the tasters agreed on a list of flavours and began the discussion of terminus, reduction, harmonization and description of varietal typicity, determining which flavours must be included in the wine (demanded) and which may be in wine (admitted). After that three samples of 'Traminer rose', vintage 2009 and/or 2010, were evaluated by the same procedure.

RESULTS AND DISCUSSION

The results are summarised in two protocols of sensory analysis:

1ST PROTOCOL

Proceedings KaM SK 01/2010 of sensory analysis for identification and selection of descriptors for a semi-quantitative description of the flavour of Slovak 'Grüner Veltliner':

Date of analysis: 21.06.2010

Place: laboratory of wine analysis

Head of panel: one expert

Jury: five experienced tasters

Aim: Identification and assessment of descriptive flavours which are typical and characteristic for the variety 'Grüner Veltliner' ('Veltínske zelené') without respect to vineyard management, method of harvest and vinification process.

Process: In the sensory boxes three samples of the same wine variety, but from different winemakers were submitted for identification of main flavour and semiquantitative estimation of their intensity. A member of the panel must put down flavours one by one in the order, in which they should be identified. Then after discussion about terms and descriptions the tasting panel determines descriptors of flavour typical for the wine variety (Table 1).

Table 1: Setting of flavours of 'Grüner Veltliner'

Type of flavour	Description of flavour	Intensity*
requested	1) acidity	3
	2) body	2
	3) almond	2 – 1
	4) lime-tree flowers	1 – 2
admitted	1) honey	1 – 2

* 1: low; 2: identifying; 3: high

The colour of the wine was green, yellow-green or green-yellow with excellent clarity. Acid in wine provides a backbone for this wine and keeps the fruity character.

2ND PROTOCOL

Proceedings KaM SK 02/2010 of sensory analysis for identification and selection of descriptors for a semi-quantitative description of the flavour of Slovak 'Traminer rose':

Date of analysis: 25.06.2010

Place: laboratory of wine analysis

Head of panel: one expert

Jury: five experienced tasters

Aim: Identification and assessment of descriptive flavours which are typical and characteristic for the variety 'Traminer rose' ('Tramín červený') without respect to vineyard management, method of harvest and vinification process.

Process: In the sensory boxes three samples of the same wine variety, but from different winemakers were submitted for identification of main flavour and semi-quantitative estimation of their intensity. A member of the panel must put down flavours one by one in the order, in which they should be identified. Then after discussion about terms and descriptions the tasting panel determines descriptors of flavour typical for the wine variety (Table 2).

Table 2: Setting of flavours of 'Traminer rose'

Typ of flavour	Description of flavour	Intensity*
requested	1) acidity	2
	2) body	3 - 2
	3) spiciness	2
	4) rose flowers	1 - 2
admitted	1) honey	1 - 2

* 1: low; 2: identifying; 3: high

The colour of the wine was yellow-green or yellow with excellent clarity. Wines provide a slightly astringent feel and full-blown fruit quality. Acidity gives this wine a refreshing character.

CONCLUSIONS

Evidence gathered in this study indicates that a 'Grüner Veltliner' from the low Carpathian region is a fresh and fruity wine and its aroma is like lime-tree flowers with harmony in palate. 'Traminer rose' from the low Carpathian region is spicy, with lower contents of acids and smells of rose flowers.

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