



DETERMINATION OF AROMA PROFILE OF GRAPE BRANDIES APPLYING GC-FID TECHNIQUE

Elena Bogeveva¹, Rajko Vidrih², Nataša Poklar Ulrih², Klemen Bohinc³, Violeta Ivanova-Petropulos¹

¹Faculty of Agriculture, Goce Delcev University, Stip, Republic of N.Macedonia

²Biotechnical Faculty, University of Ljubljana, 1000 Ljubljana, Slovenia

³Faculty of Health Sciences, University of Ljubljana, 1000 Ljubljana, Slovenia

INTRODUCTION

🍷 Macedonian grape brandies made by traditional methods

🍷 12 aroma compounds were identified and quantified in the samples. acetaldehyde, 1-butanol, isobutanol, hexanol, 2-methyl-1-butanol, methanol, 1-propanol, 2-phenylethanol, ethyl acetate, ethyl lactate, isoamyl acetate, and propyl acetate.

🍷 Aromatic profiles of grape brandies using GC-FID.

OBJECTIVE

🍷 **Acetaldehyde** is a primary product of alcoholic fermentation and contributes to fruity, grassy, and slightly oxidative notes. In low concentrations, it positively affects the complexity of the distillate.

🍷 **Grapes samples contain high concentrations of esters and higher alcohols that contribute to a complex aromatic profile.**

METHODOLOGY

52 grapes brandies (Vranec, Temjanika, Muscat Hamburg, Rkachitel, Smederevka, Afus Ali, Plovdivina, Prokupec, Traminets, Riesling and Pinot Noir)

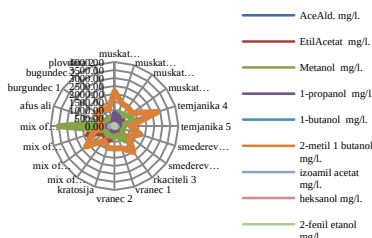
Production: All grape brandy samples were produced under domestic and traditional distillation conditions.

GC-FID instrument: HP 6890 N gas chromatograph (Agilent Technologies, Palo Alto, CA, USA).

Column: ZB WAX (30 m x 320 µm x 1 µm)

Temperature program: 40 °C 1 min., ramp 4 °C/min., final temperature 184 °C, total time 37 min.

KEY FINDINGS



🍷 **Methanol** has no positive effect on aroma and is the most important indicator of the safety of distillates.

EXPLAIN YOUR CHARTS

Simple	AceAld.	EtilAcetat	Metanol	1-propanol	1-butanol	2-metil 1-butanol	izoamil acetat	heksanol	2-fenil etanol
	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
muskat	35.20	341.87	530.59	775.64	5.74	2173.84	25.64	15.20	33.02
muskat	22.84	342.72	924.94	640.38	6.61	1481.83	71.64	16.49	21.95
muskat	45.81	414.77	773.26	521.35	5.74	1426.82	58.47	13.08	24.14
muskat	82.02	623.05	1176.48	186.83	n.d.	1366.45	19.04	18.30	5.95
temjanika 4	94.57	326.93	1209.28	318.21	9.06	2826.29	n.d.	14.07	14.03
temjanika 5	274.67	596.47	469.87	176.54	n.d.	1013.12	58.48	6.24	24.03
smederevka 4	14.79	296.58	550.36	218.43	n.d.	1704.50	141.15	6.48	40.45
smederevka 5	99.87	457.51	606.18	94.13	n.d.	1088.88	22.55	21.22	31.42
mix of grape 3	144.80	1065.25	738.96	252.44	11.66	1128.51	48.47	7.45	40.93
mix of grape 4	54.44	621.60	557.22	209.65	n.d.	2206.36	51.93	7.00	33.98
mix of grape 7	212.12	1753.92	809.19	163.85	7.75	1406.98	18.89	4.36	38.46
mix of grape 8	185.48	1144.19	3523.10	443.42	31.29	783.50	296.40	11.82	23.88
afus ali	50.49	321.50	687.93	194.96	6.06	929.13	121.77	n.d.	45.10
burgundec 1	93.48	521.74	620.12	114.09	n.d.	1327.06	27.10	13.44	65.99
burgundec 2	89.65	632.00	602.88	109.77	n.d.	1352.87	27.72	13.61	65.68
plovdivina 2	233.24	520.14	520.63	185.18	n.d.	1128.08	0.00	14.70	17.34

According to eur-lex/regulation 2019/787 all samples are below the maximum permitted concentrations

CONCLUSION

🍷 As for alcohols, 2-methyl-1-butanol was most abundant in the aromatic grape brandy Temjanika.

🍷 Methanol was also detected in the samples within limits below the maximum allowed in European Union (2 000 mg/L), except in one sample. This indicates that the domestic brandies were safe for consumption in moderate quantities

ACKNOWLEDGEMENT - The work was supported by the CEEPUS Network scholarship (M-RS-1816-2324-186534)