



# **BIOSYNTHESIS ASPECTS ABOUT SPECIFIC COMPOUNDS OF WINE**

Characterization of polyphenols in red grapes and their modifications during wine making and maturation

# Antioxidant and elemental profiling to characterize wines of specific geographical and varietal origin

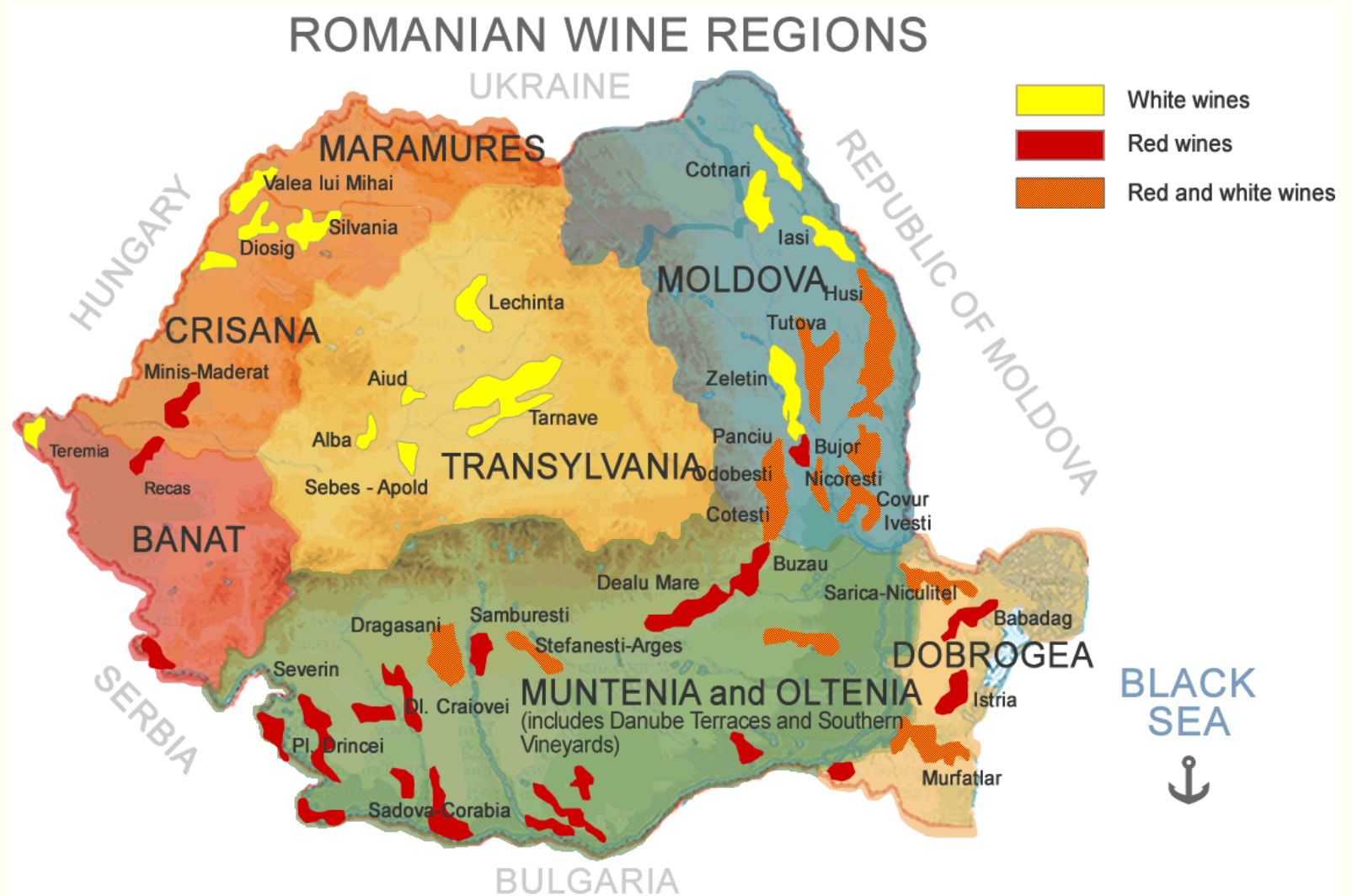
3 varieties (Cabernet Sauvignon, Merlot, Feteasca Neagra)

✓ Variety

✓ Vintage

✓ Microclimate

Comparison of common varieties in Romania



Grape and wine samples were studied for classification according to grape cultivar and provenance by:

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## Volatile profiling

GC-MS

Electronic Nose

## Polyphenol profiling

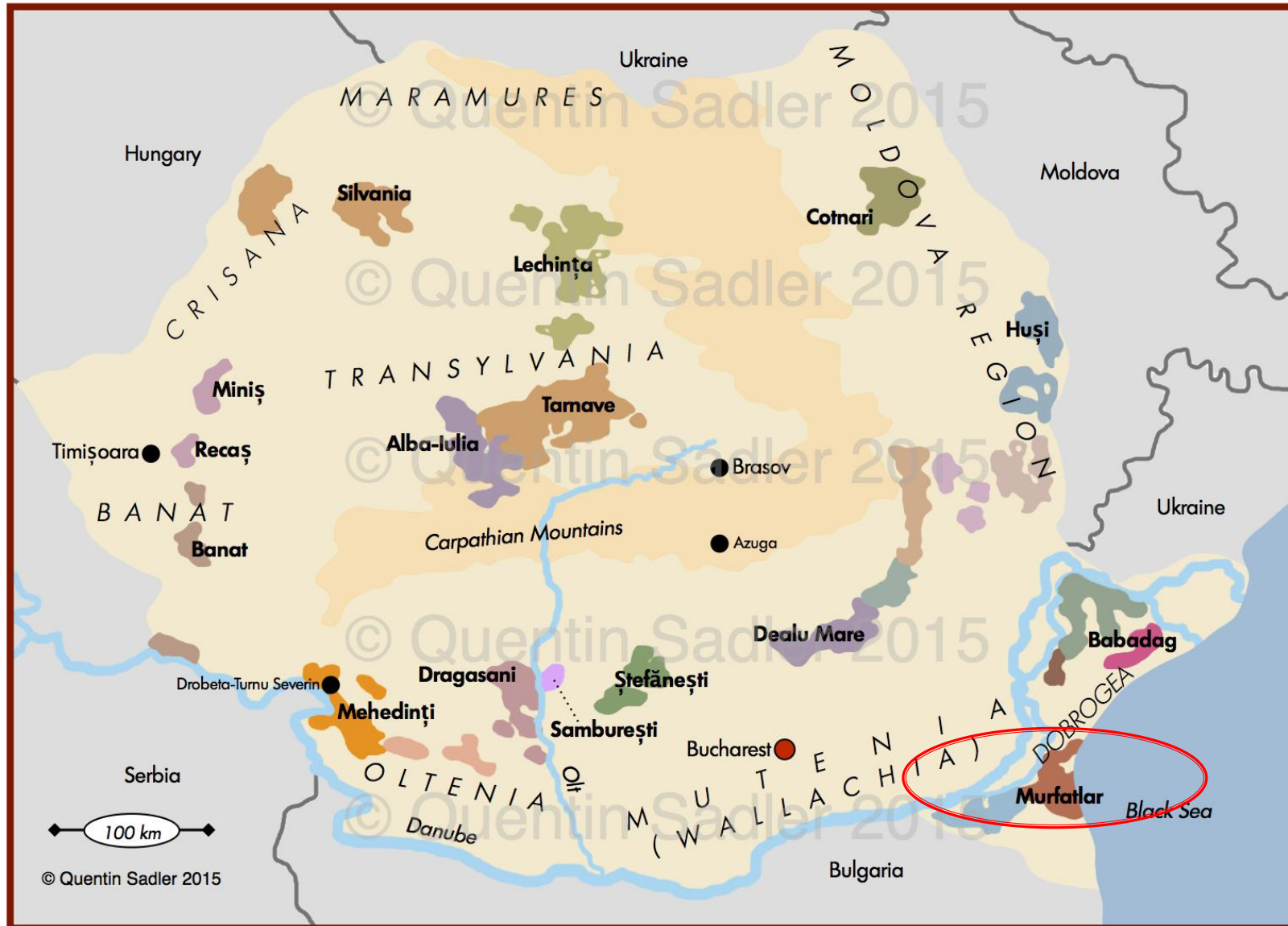
Total polyphenol content

Antioxidant activity

- ❖ DPPH antiradical capacity
- ❖ Co(II)/ EDTA Luminol chemiluminescence

LC-MS

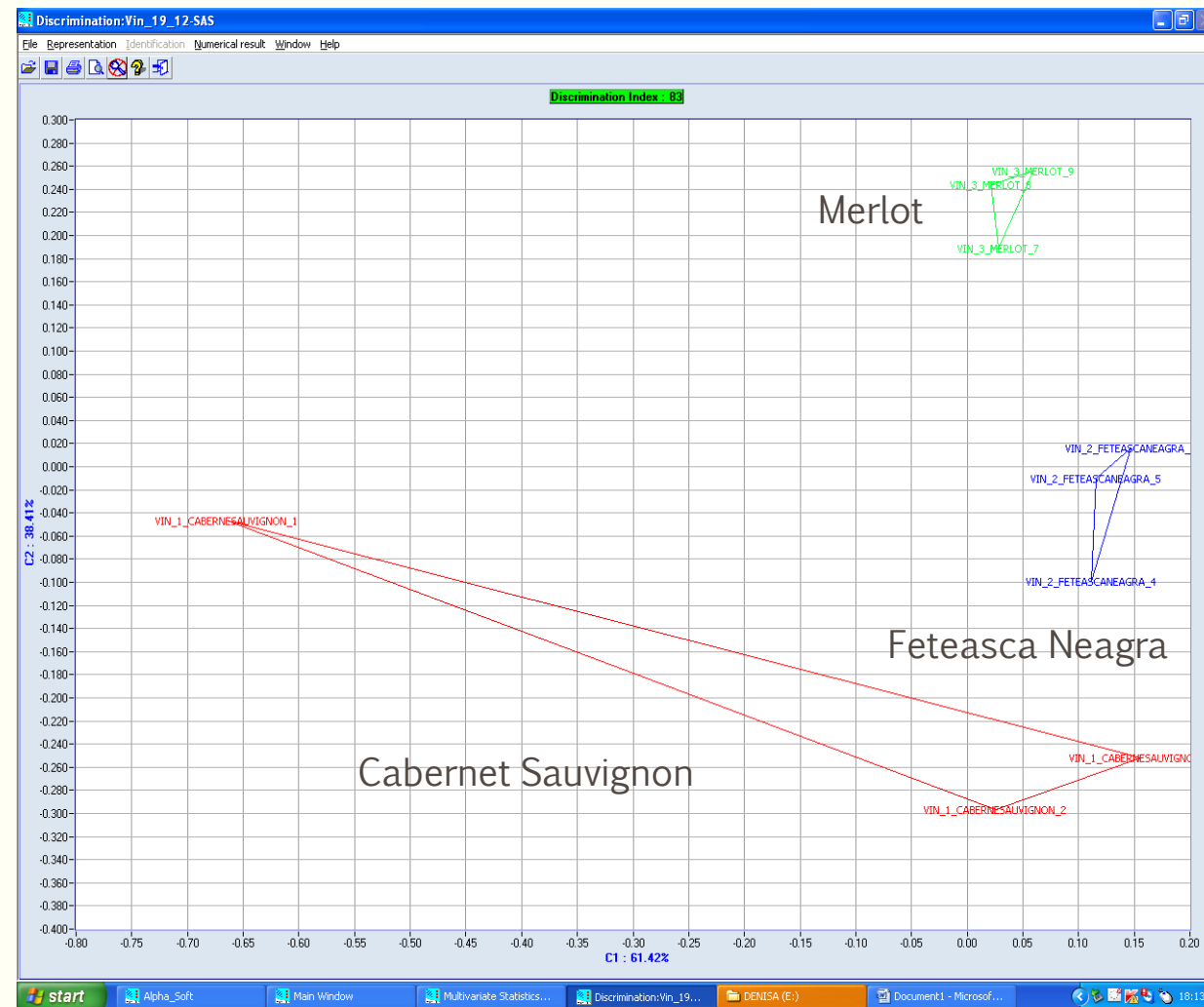
# Cabernet Sauvignon wines from Murfatlar vineyard



# GC-MS and E-nose analysis of three must samples from Murfatlar

Compounds	% Area		
	F.N.	C.S.	M.
1 butanoic acid , methyl ester	26.14	28.68	12.66
2. 2-ethyl heptanoic acid	10.94	6.7	9.12
Ratio 1:2	2.389	4.28	1.388
3. c-terpinen	3.98	3.88	2.47
4. linalool	2.81	1.94	3.37
Ratio 3:4	1.416	2	0.732

Ratios of the area percentages of the three must samples



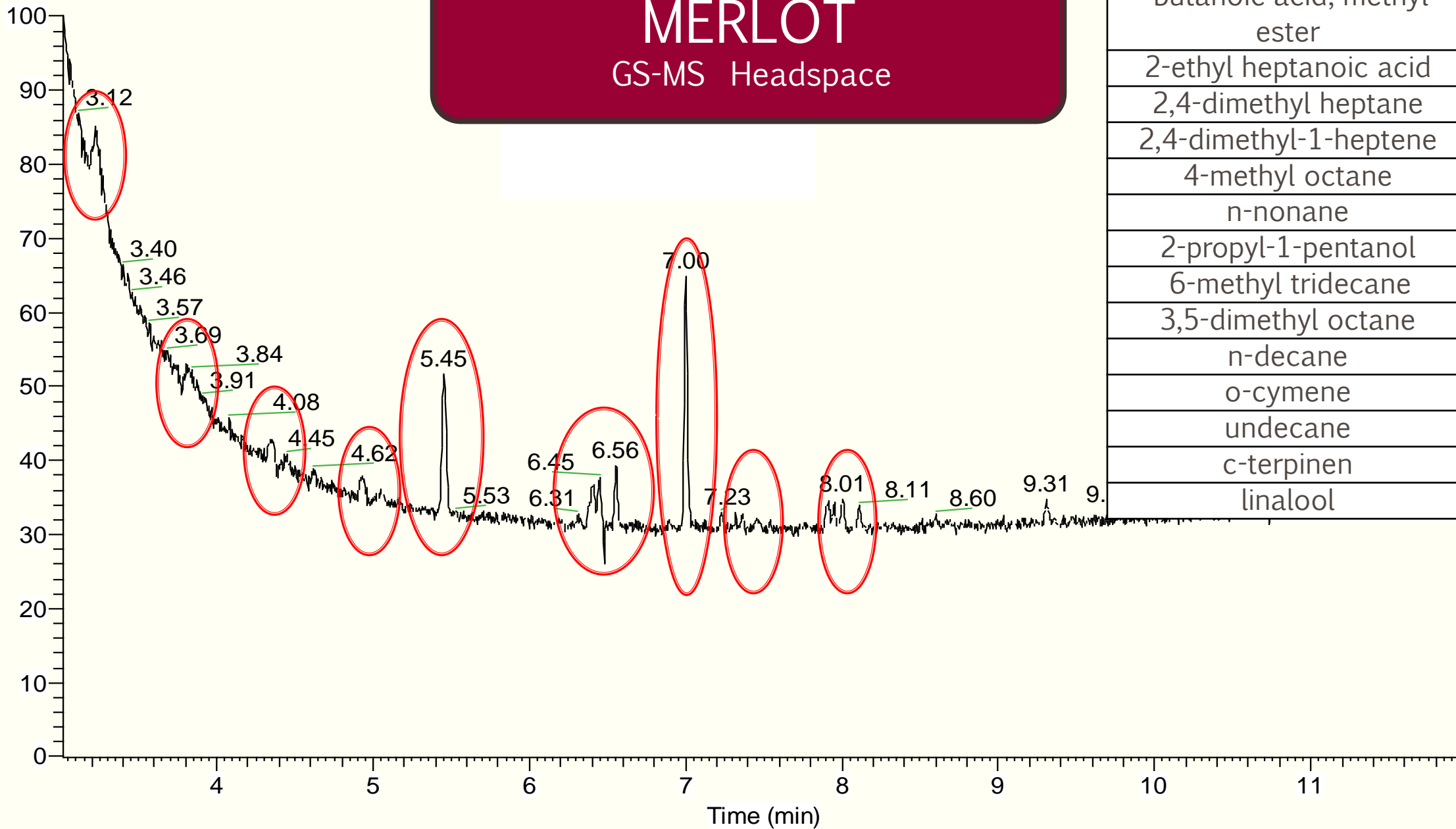
PCA analysis for the three must samples

A good differentiation of the samples was obtained, that is 83

RT: 3.01 - 12.00

# MERLOT

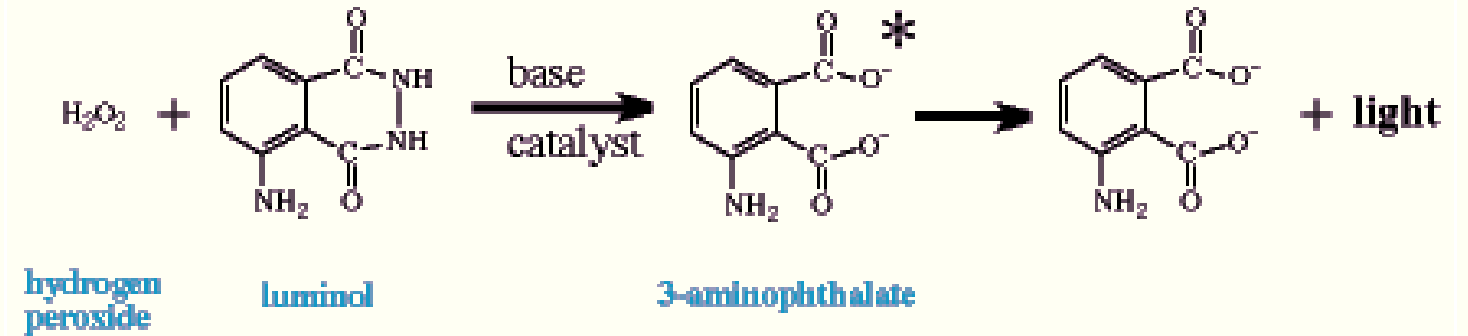
GS-MS Headspace



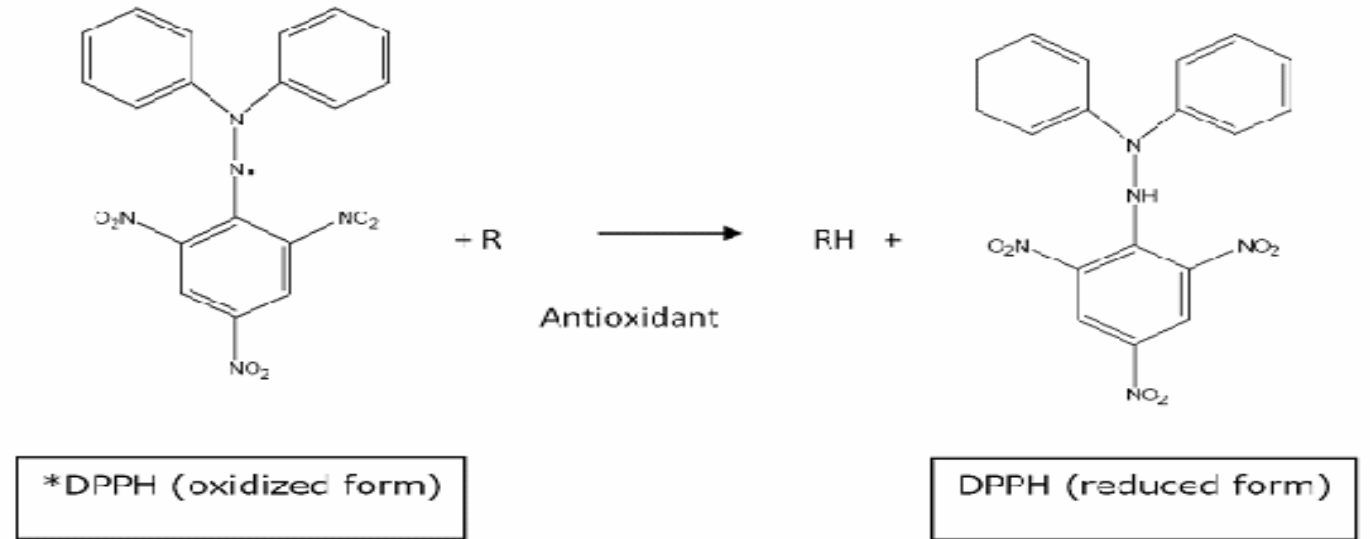
Compound	% Area
butanoic acid, methyl ester	12.66
2-ethyl heptanoic acid	9.12
2,4-dimethyl heptane	7.1
2,4-dimethyl-1-heptene	3.12
4-methyl octane	4.83
n-nonane	14.02
2-propyl-1-pentanol	6.11
6-methyl tridecane	8.77
3,5-dimethyl octane	4.52
n-decane	17.38
o-cymene	2.78
undecane	3.74
c-terpinen	2.47
linalool	3.37

# Determination of antioxidant activity

Co(II)/ EDTA- Luminol chemiluminescence



DPPH antiradical capacity



\* DPPH = 1, 1-diphenyl-2-picrylhydrazyl

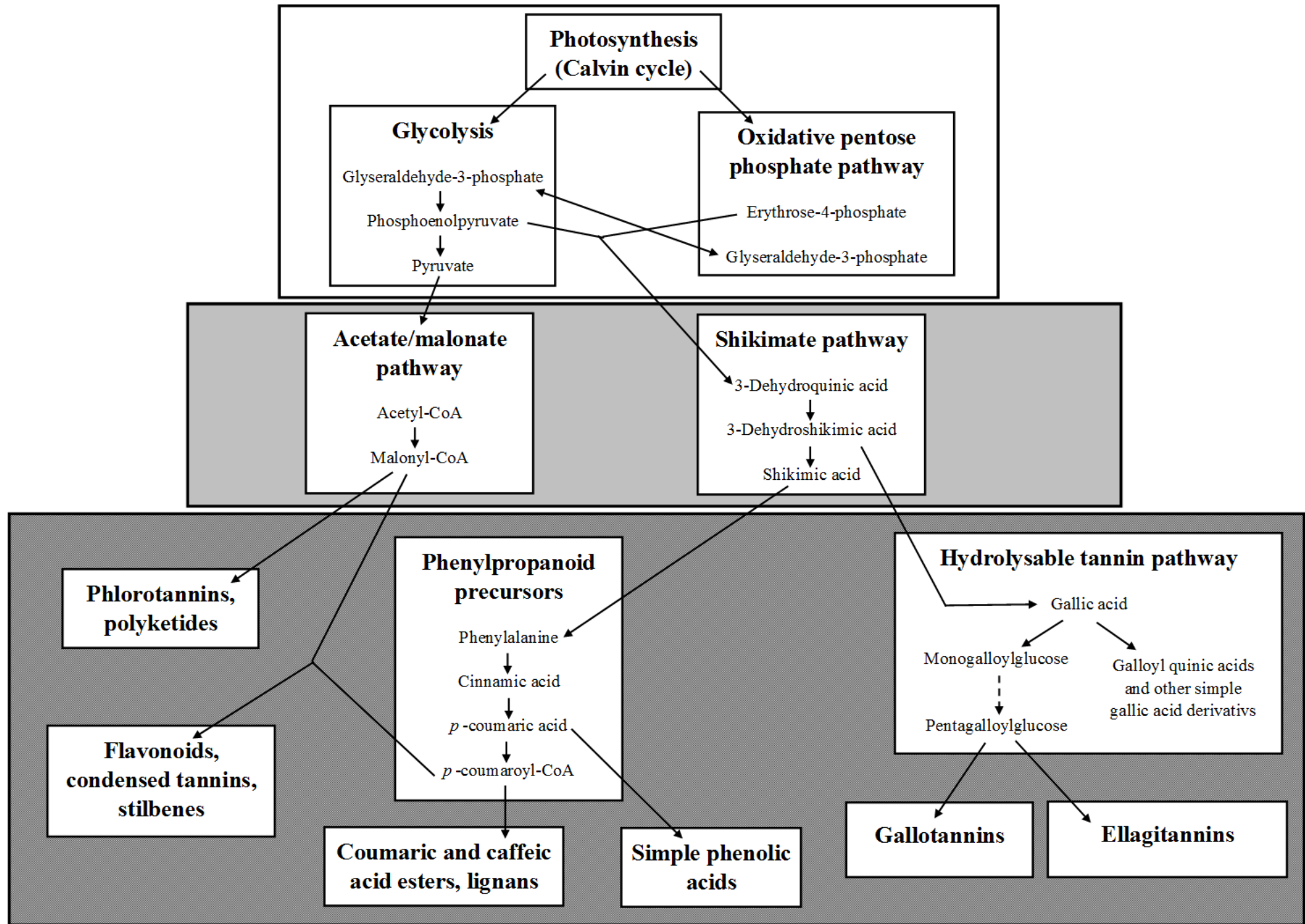
# Modifications during wine maturation

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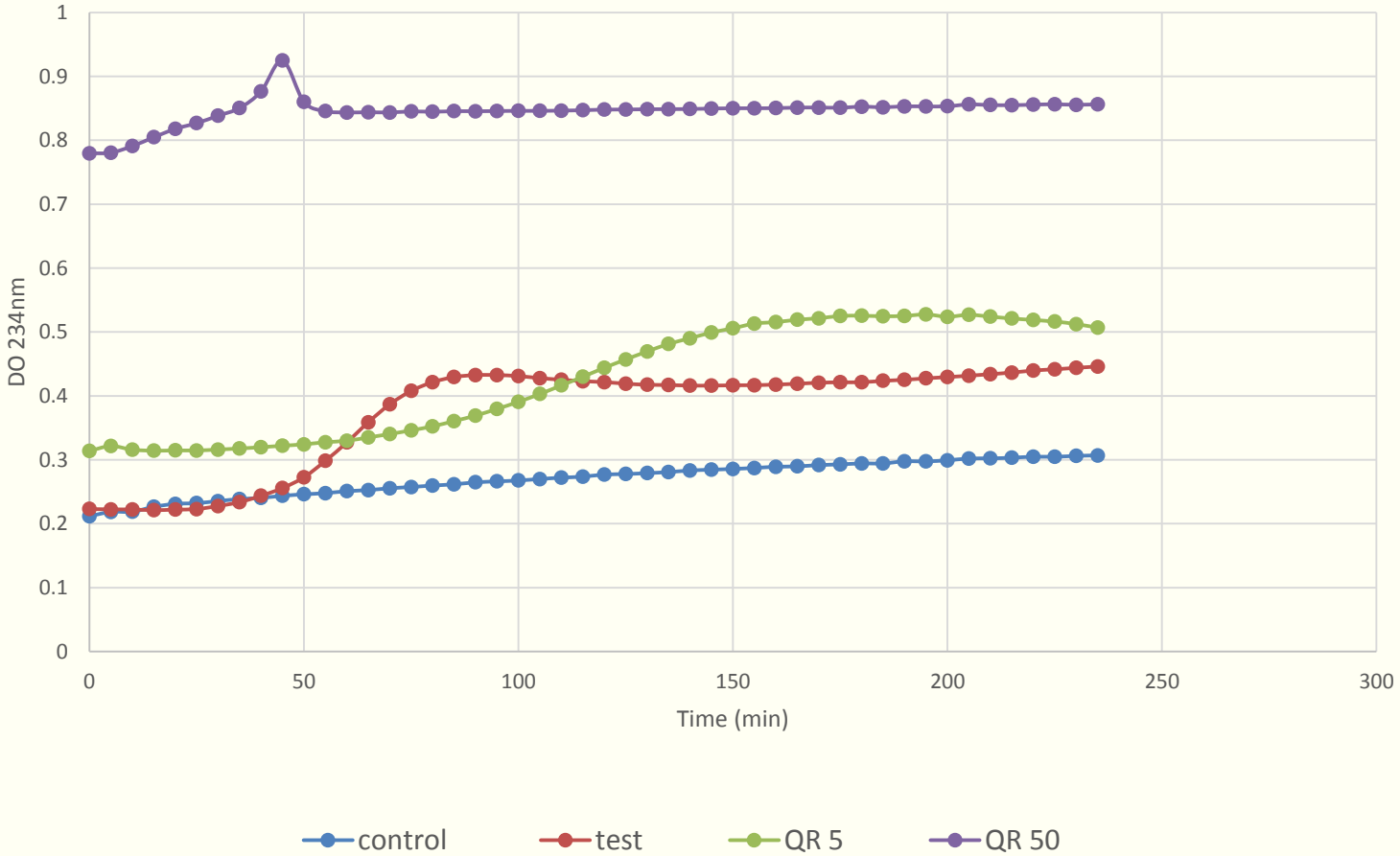
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		TPC (mg/L GAE)	DPPH ( $\mu\text{M}$ QE)	Chemiluminescence ( $\mu\text{M}$ QE)
FN	Stage 1	396.18	4100.21	1066.02
	Stage 2	427.36	4360.64	1466.81
	Stage 3	439.36	4463.03	1514.32
M	Stage 1	335	3793.03	787.22
	Stage 2	417.36	4325.02	1130.88
	Stage 3	461.54	4543.16	1563.89
CS	Stage 1	372.37	4475.20	973.54
	Stage 2	411.72	4650.09	1182.62
	Stage 3	421.90	4756.85	1880.32





# Copper-mediated LDL oxidation in presence of polyphenol model solutions

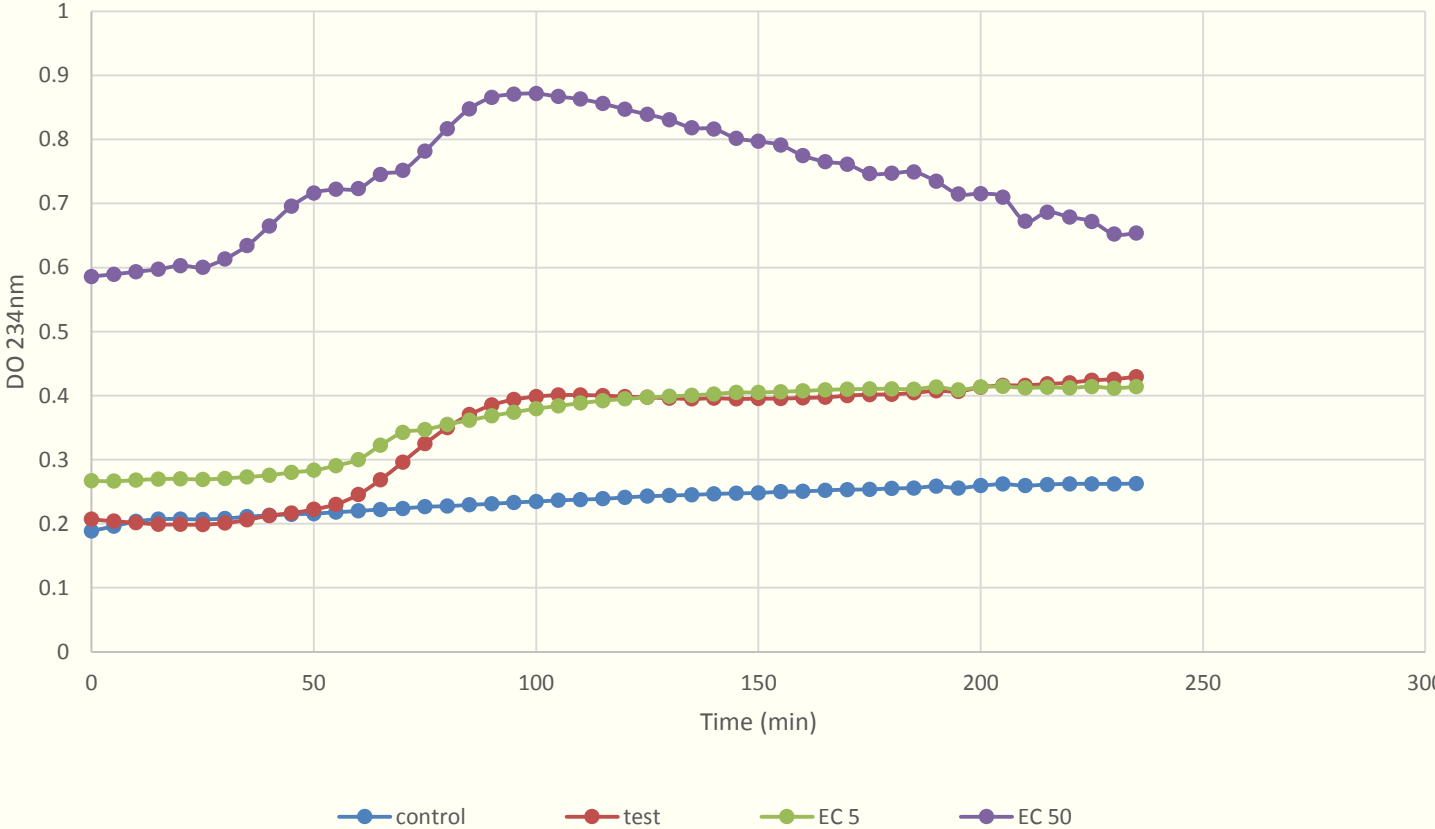


Quercetin rhamnoside oxidation kinetics

# Copper-mediated LDL oxidation in presence of polyphenol model solutions

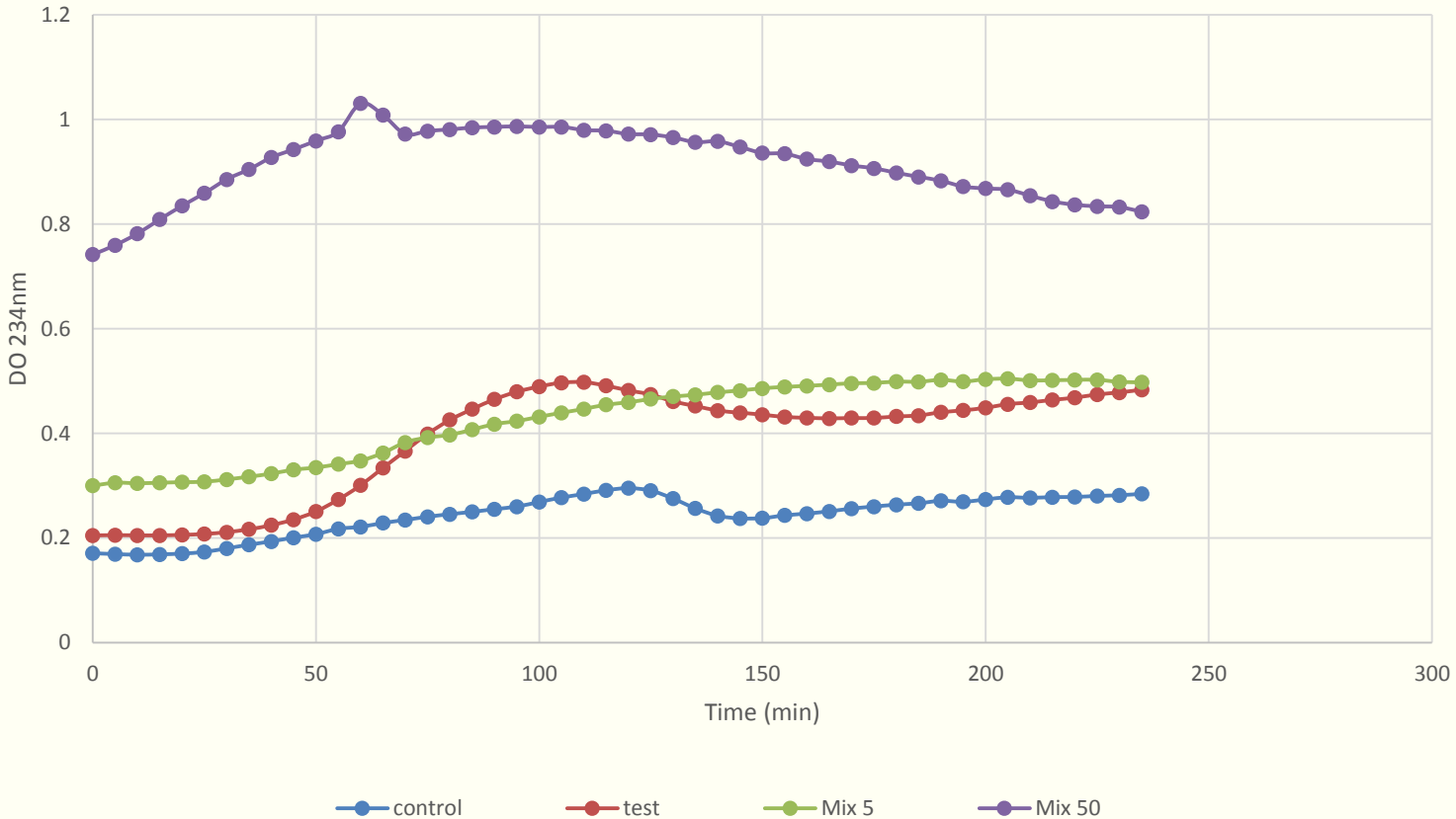
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Epicatechin oxidation kinetics

# Copper-mediated LDL oxidation in presence of polyphenol model solutions

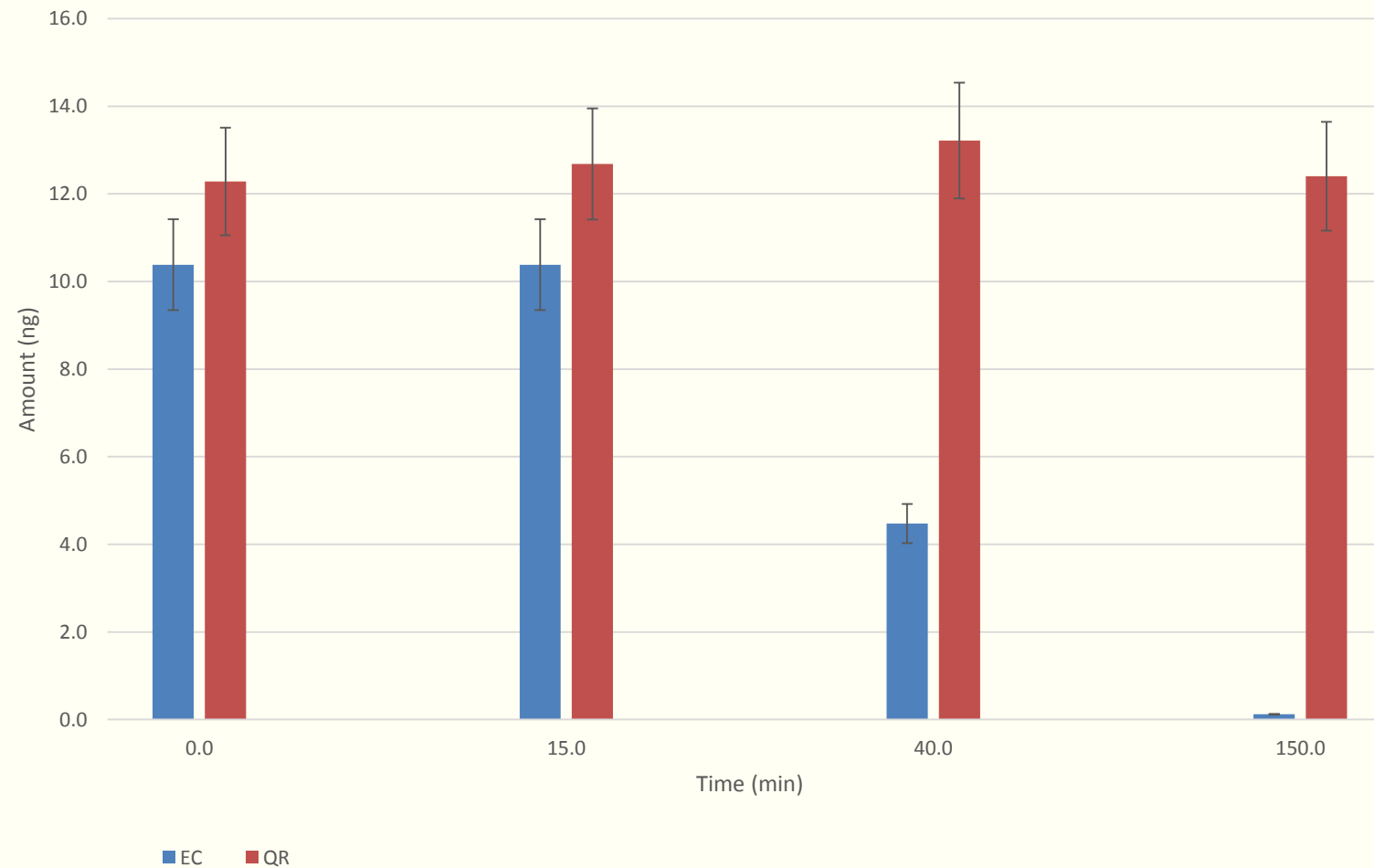


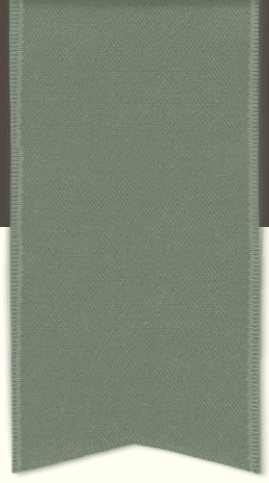
Mix (quercetin rhamnoside + epicatechin) oxidation kinetics

# Evolution of EC and QR during LDL oxidation (50 $\mu$ M)

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Thank you for your  
attention!