

# Influence of some enological treatments on *trans*-resveratrol and total phenolic content in wine



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## Aim

In this study, the influence of winemaking techniques and grape cultivars on *trans*-resveratrol and total phenolic content in wines was studied. It was investigated content of *trans*-resveratrol and total phenolic compounds in Prokupac, Cabernet Franc and Traminac variety.

## Material and methods

The effect of different yeast strains and enzyme preparations on *trans*-resveratrol and total phenolic content was examined on wine samples obtained from Prokupac variety grapes. After grapes crashing and destemming, the samples were sulfited with 10 g of  $K_2S_2O_5$  per 100 kg grape pomace. Selected yeasts and enzymes preparation with different glycolytic activities "OE" and " $\beta$ " (Lallemand, Canada) were used.

Cabernet franc wine samples in which biological deacidification by use of pure culture of lactic acid bacteria *Oenococcus oeni*-Uvaferm alfa (Lallemand, Canada).

The Traminac wine samples were enriched with *trans*-resveratrol (2.5 mg/l) produced by Sigma (Darmstadt, Germany). Increasing amounts of bentonite: 0, 50 and 100 g/hl were added to wine (200 ml) obtained from the Traminac grape variety, which has been previously enriched with resveratrol. After keeping for 7 days in the fridge (5°C), the wines were separated from the precipitation and *trans*-resveratrol and total phenolic content were analyzed. Determination of total phenolic content in wines was measured by Folin-Ciocalteu method and *trans*-resveratrol content was determined using HPLC with UV detection.

## Results

Yeast 299 used with the enzyme preparation OE showed the best extraction of *trans*-resveratrol content where a maximal recorded amount was 1.56 mg/l, while a minimal amount of *trans*- isomers was found in wine obtained from yeast 2056 in combination with enzyme  $\beta$  (0.48 mg/l).

Table 1. The effect of enzymes and yeast strains on the amount of *trans*-resveratrol and total phenolic content in Prokupac variety wine

Prokupac wine samples	<i>Trans</i> -resveratrol (mg/l)	Total phenolic content (mg GAE/l)
BDX	1.02±0.04	1645.60
BDX + $\beta$	0.75±0.04	1016.20
BDX + OE	0.70±0.04	1445.00
299	0.78±0.04	1151.92
299 + $\beta$	0.64±0.04	961.60
299 + OE	1.56±0.04	1774.20
2056	0.98±0.04	1258.90
2056 + $\beta$	0.48±0.04	903.00
2056 + OE	0.98±0.04	1609.60

★ There are no changes in the *trans*-resveratrol and total phenolic content were observed in pasteurized and unpasteurized samples.

## Conclusion

Analyzing Prokupac wine samples it was noticed that the combination of yeast 299 with the enzyme preparation OE showed the best extraction of *trans*-resveratrol (1.56±0.04) and total phenolic content (1774.20 mg GAE/l). Also, biological deacidification, pasteurization and use of some clarifying agents (bentonite and gelatine) had no influence on *trans*-resveratrol and total phenolic content.

★ Inoculation of Cabernet Franc wine sample with *Oenococcus oeni* bacteria had no influence on the content of *trans*-resveratrol and total phenolic content.

Table 2. *Trans*-resveratrol and total phenolic content in treated and untreated wine

Wine sample	<i>Trans</i> -resveratrol (mg/l)	Total phenolic content (mg GAE/l)
Cabernet franc (control sample)	1.47±0.04	1620.30
Cabernet franc (treated)	1.45±0.04	1618.10

★ Analysis of *trans*-resveratrol content in wine samples treated with increasing amounts of bentonite and gelatine in this range revealed no changes in *trans*-resveratrol and total phenolic content in the wine samples.

Table 3. The effect of clarifying agents on the *trans*-resveratrol and total phenolic content

Wine samples	<i>Trans</i> -resveratrol (mg/l)	Total phenolic content (mg GAE/l)
Traminac (control sample)	2.61±0.04	120.10
Traminac (bentonite 50 g/hl)	2.59±0.04	120.10
Traminac (bentonite 100 g/hl)	2.63±0.04	120.10
Cabernet franc (control sample)	1.47±0.04	1620.30
Cabernet franc (gelatine 5 g/hl)	1.45±0.04	1610.00
Cabernet franc (gelatine 10 g/hl)	1.49±0.04	1600.00