

Applying different maceration treatments to increase the antioxidant capacity and vitamin content of Malvazija istarska wines

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INTRODUCTION

Besides its hedonic nature, wine is a natural beverage with certain **health-related properties**, which is why the consumer's interest towards wines with a higher concentration of **bioactive compounds** has increased over recent years. Extracted from grapes, antioxidants and vitamins are naturally present in wines but their concentrations differ according to the applied winemaking technique. The **maceration** process is less frequently carried out for the production of white wines in relation to red wines for several reasons, but its application may be suggested to increase wine antioxidant capacity and nutritional value.

The aim:

To investigate the effect of applying different **maceration** processes on **antioxidant capacity** and **vitamin content** of wines produced from an autochthonous Croatian white grape variety, Malvazija istarska (*Vitis vinifera* L.).

MATERIALS AND METHODS

- Institute of Agriculture and Tourism (Poreč, Croatia) – vintage 2019
- **six vinification treatments:** non-maceration control treatment (C), pre-fermentative two days cryomaceration treatment at 8 °C (CRYO), seven days maceration treatment at 16 °C (M7), and prolonged post-fermentative maceration treatments at 16 °C for 14 days (M14), 21 day (M21), and 42 days (M42)
- **the antioxidant capacity** - ferric reducing/antioxidant power, **FRAP** (mM Fe²⁺) assay and the oxygen radical absorbance capacity, **ORAC** (mM Trolox) assay
- **chromatographic analyses** - liquid chromatography system with a DAD and single quadrupole mass detector equipped with electrospray ionization interface. Identification of five vitamins (**B1, B2, B3, B6** and **C**)
- statistical data analysis was performed using one-way analysis of variance (ANOVA) and Fischer's least significant difference (LSD)

RESULTS

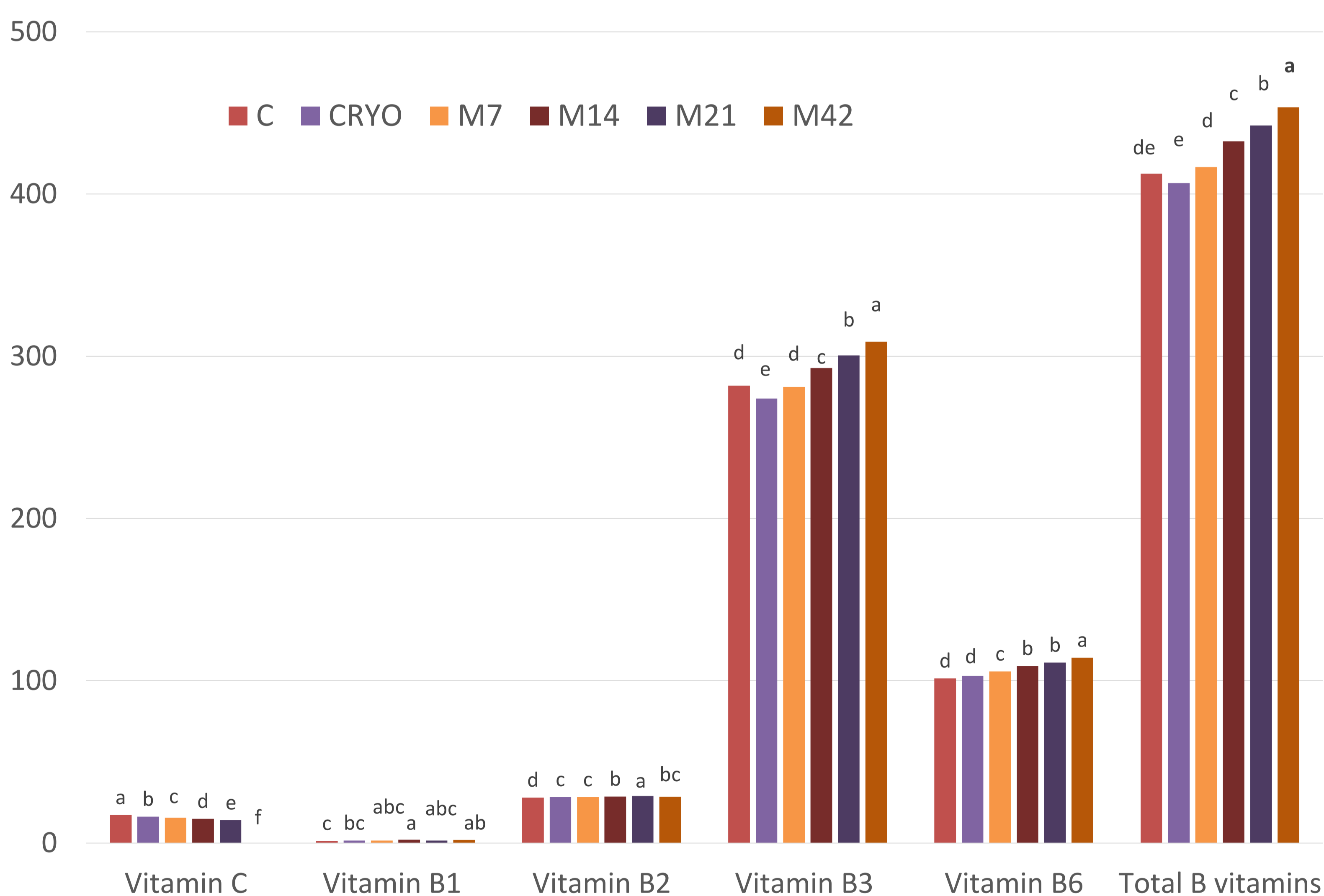


Figure 1. The concentration of individual vitamin and total B vitamin concentration (µg/L) among different treatments

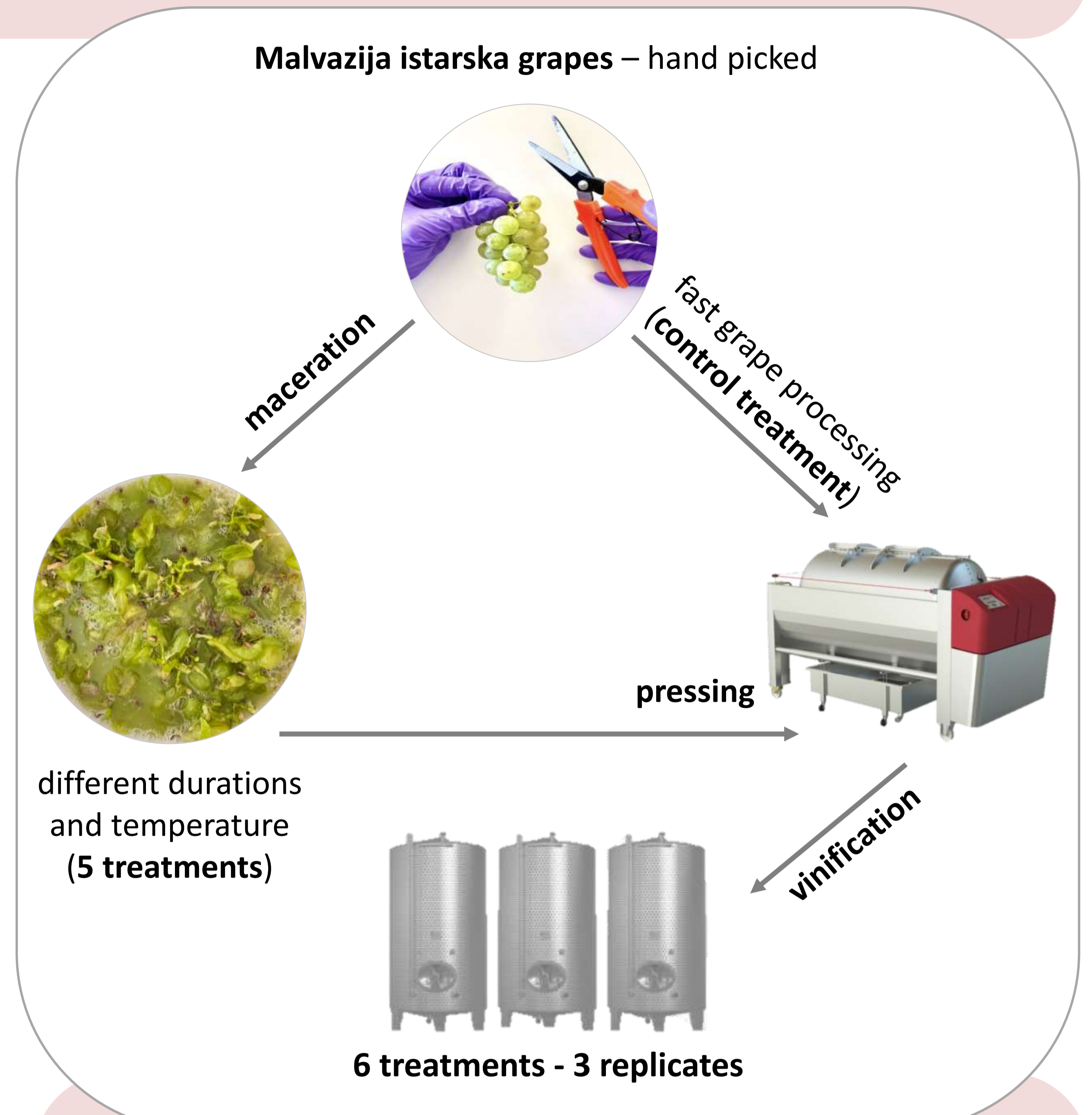
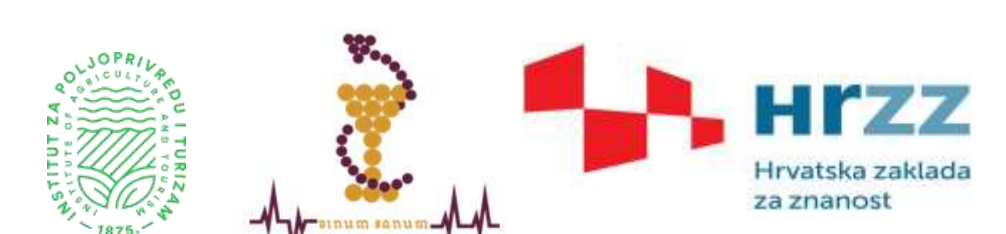
- antioxidant capacity increased proportionally with the maceration duration according to FRAP and ORAC assays
- antioxidant properties are mostly related to phenolic compounds which are mainly present in prolonged maceration treatments such as M42

CONCLUSION

Obtained results showed that prolonged maceration significantly affects both the antioxidant capacity of the wines and their vitamin content, particularly B-group vitamins. Such information may serve producers for choosing the adequate technological practice for improving wine quality and its nutritional value.

ACKNOWLEDGEMENTS

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- vitamin C - decreasing trend as the maceration progressed
- total B-group vitamins - a significant difference among treatments, proportional with maceration time – **M42** the highest concentration
- vitamin **B3** reached the highest values - significantly the highest in M42 treatment wine – a similar trend was noted in the concentration of vitamin B6

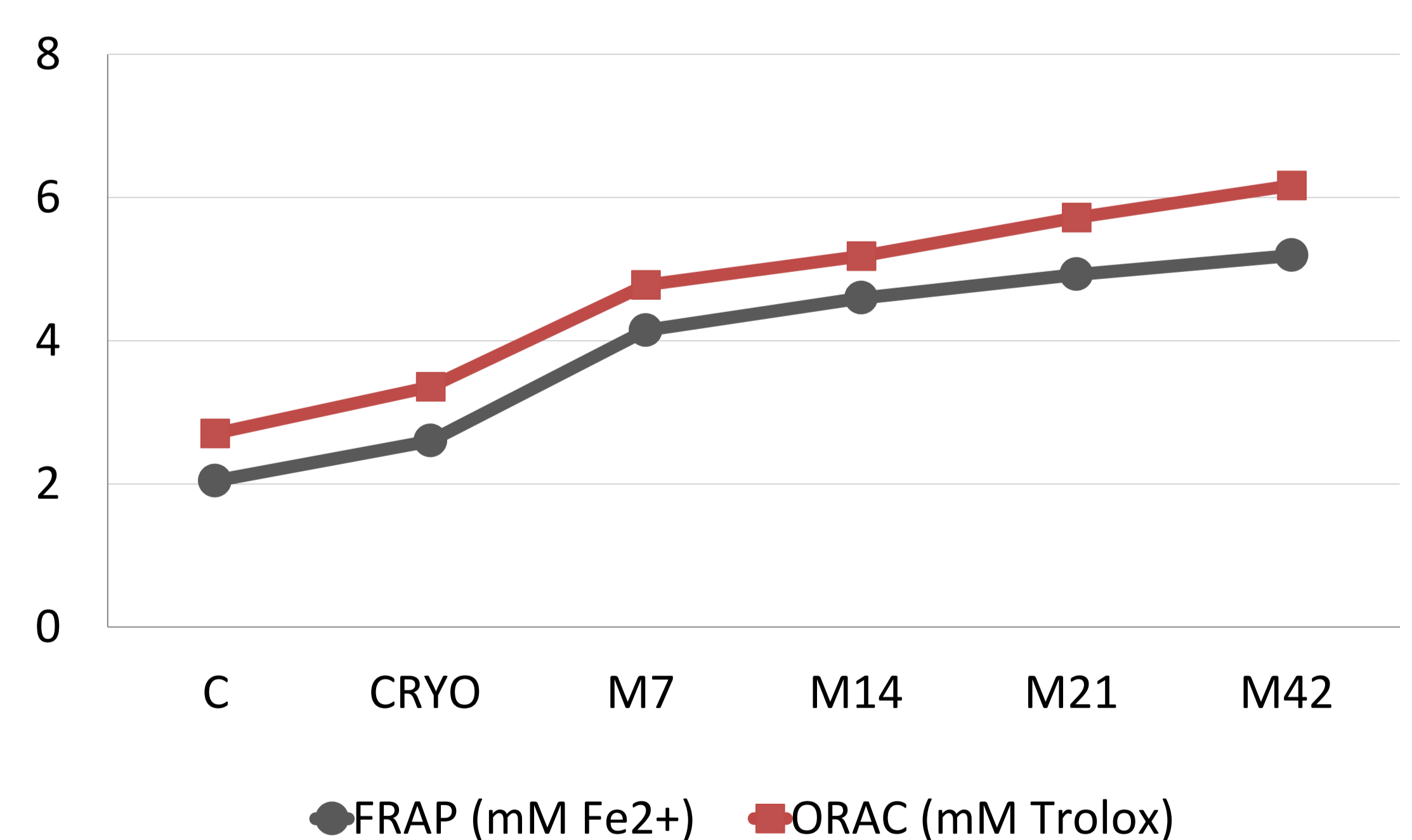


Figure 2. Antioxidant capacity of the treatments according to FRAP and ORAC assays