

# Impact of pre-fermentative and post-fermentative technologies on sensory profile and overall impression of Teran red wine

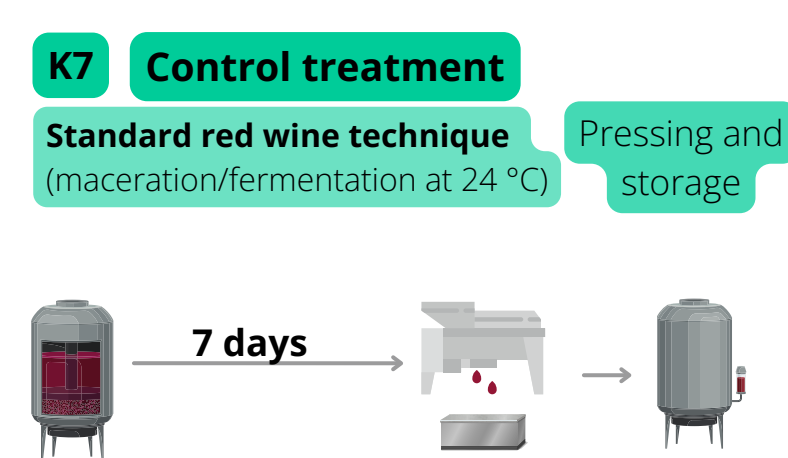
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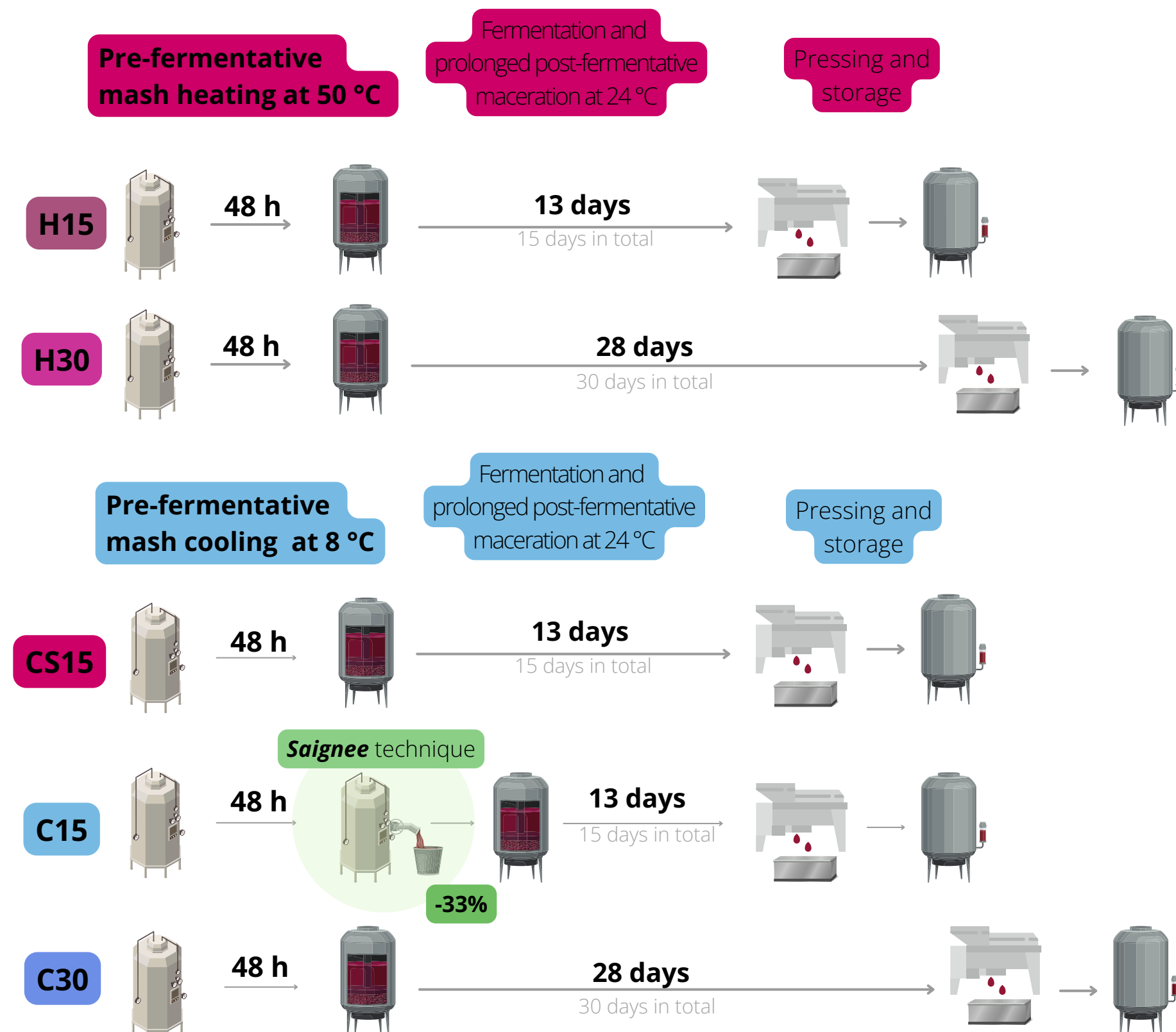
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## Introduction

- Teran (*Vitis vinifera* L.), an autochthonous Croatian red grape variety
- Grown in Western Istria, the town of Poreč, Croatia
- The harvest was held in 2020
- Manually harvested grapes were destemmed and crushed with standard equipment, homogenized and equally divided
- **Six vinification treatments were performed**
  - in three replications in 220 L stainless steel tanks



After the end of the maceration, fermented mashes were pressed and wine was racked in clean tanks. After six months the wine was bottled and stored prior to analysis.



**Pre-fermentative mash heating**, entails short heating of the skins from 50 to 80 °C, for a longer period (up to 24 h), where heat damages the hypodermal cell membranes, in this way enhancing phenolic extraction.

**Pre-fermentative mash cooling** (cold soaking or cryomaceration) could be adopted to extract water soluble compounds in the absence of alcohol at low temperatures (5 - 10 °C), mainly phenolic and volatile compounds.

## Methods

- The wine assessment took place at the Institute of Agriculture and Tourism
- Accredited sensory panel with seven expert wine tasters (ISO 17025:2017)
  - Tasting room constructed in accordance with ISO standards
  - Use of a standard 200 mL wine tasting glasses
  - 50 mL of appropriately cooled sample at 18 °C
  - 18 wine samples (6 wines × 3 replicates)
  - Both quantitative descriptive analysis (QDA) and OIV 100-point method

### Quantitative descriptive analysis (QDA)

- To evaluate wine color, aroma and taste
- Using a 10-point structured scale
- 0 = attribute not perceptible, 10 = attribute strongly perceptible
- Attributes (descriptors) sorted into groups

### The OIV 100-point method

- To evaluate the visual, nose and taste category and overall judgement, i.e., harmony of the wine with adequate number of points
- Minimum possible score 40 points, maximum possible score 100 points



## Results

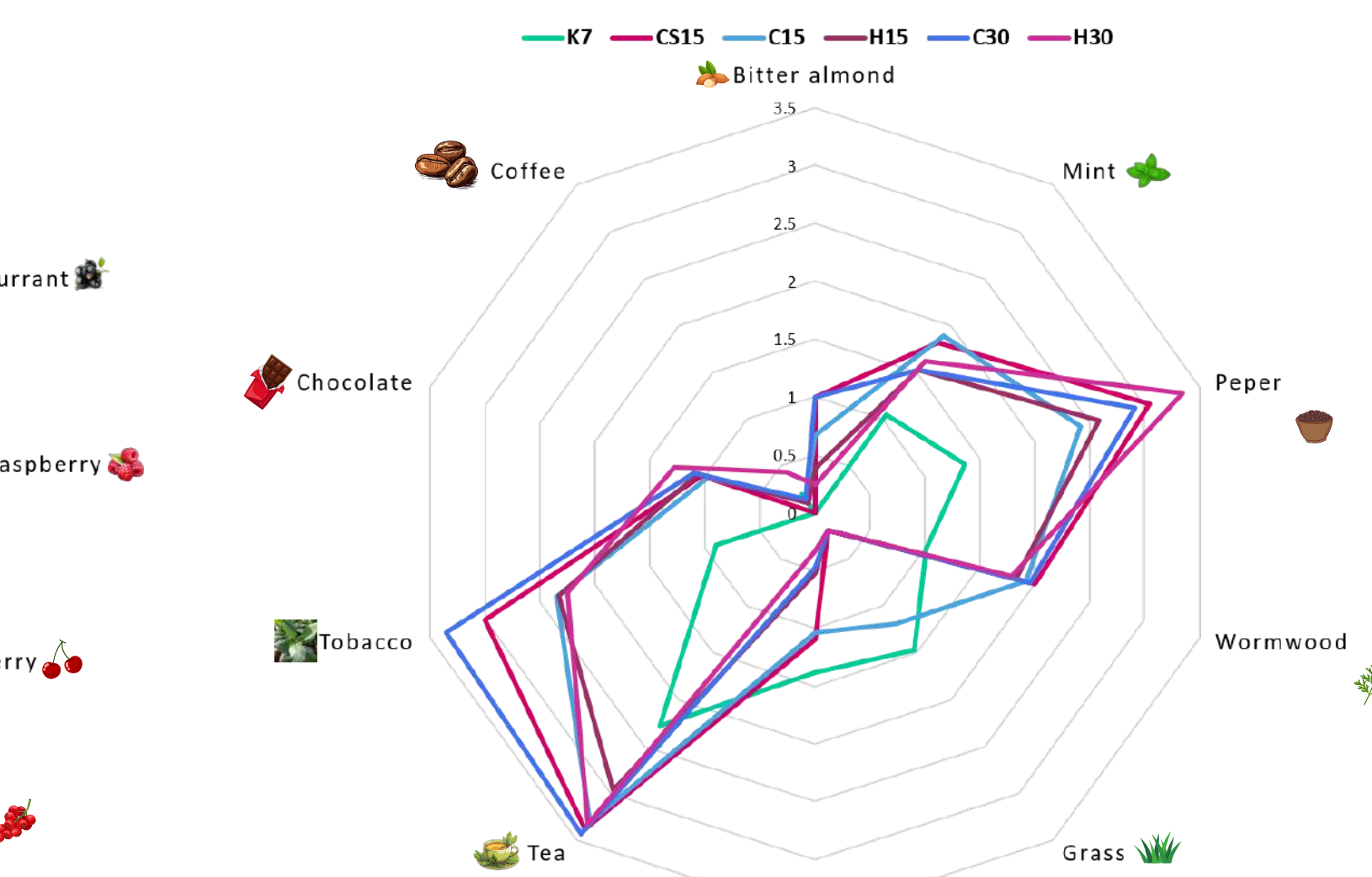
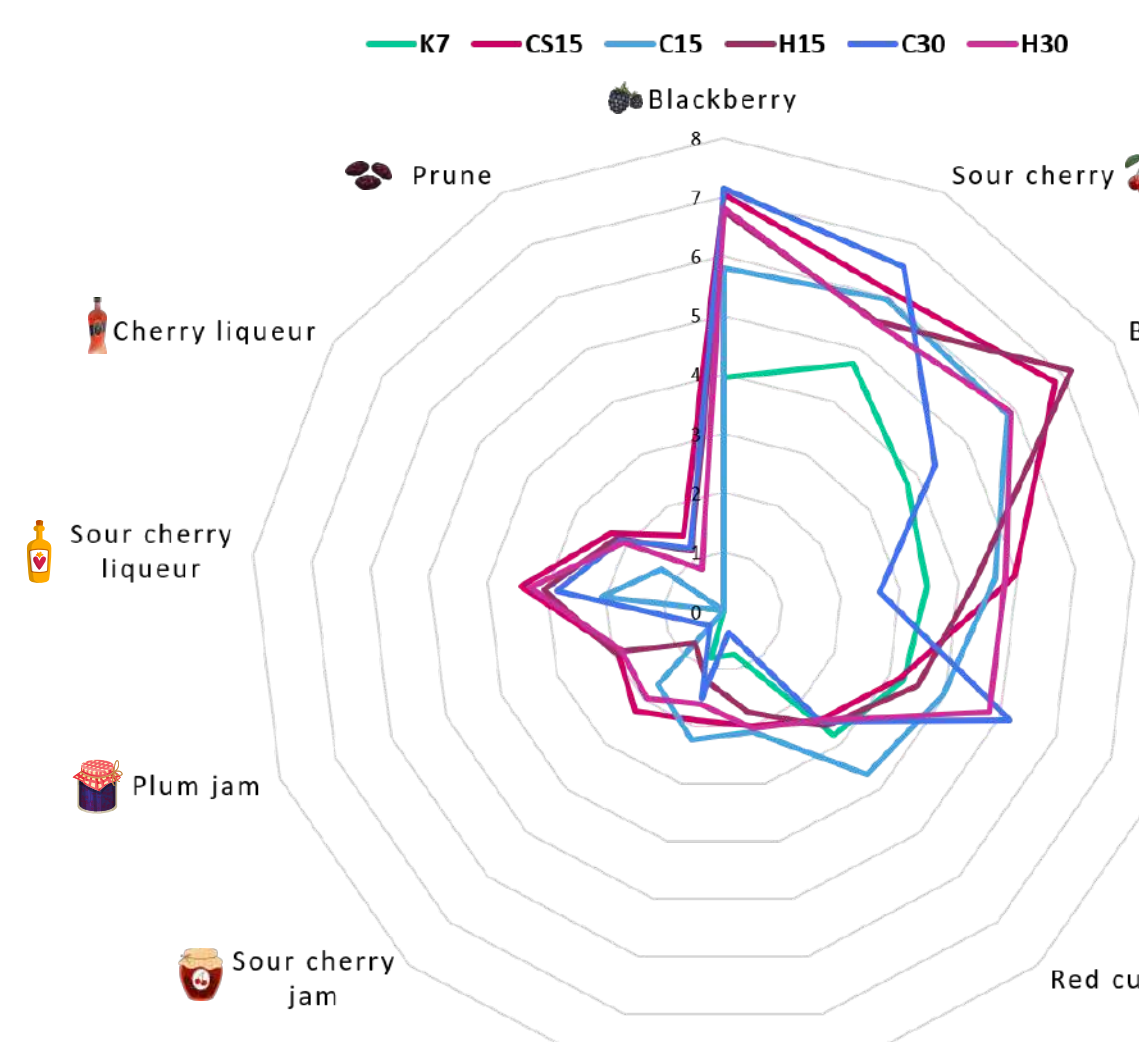
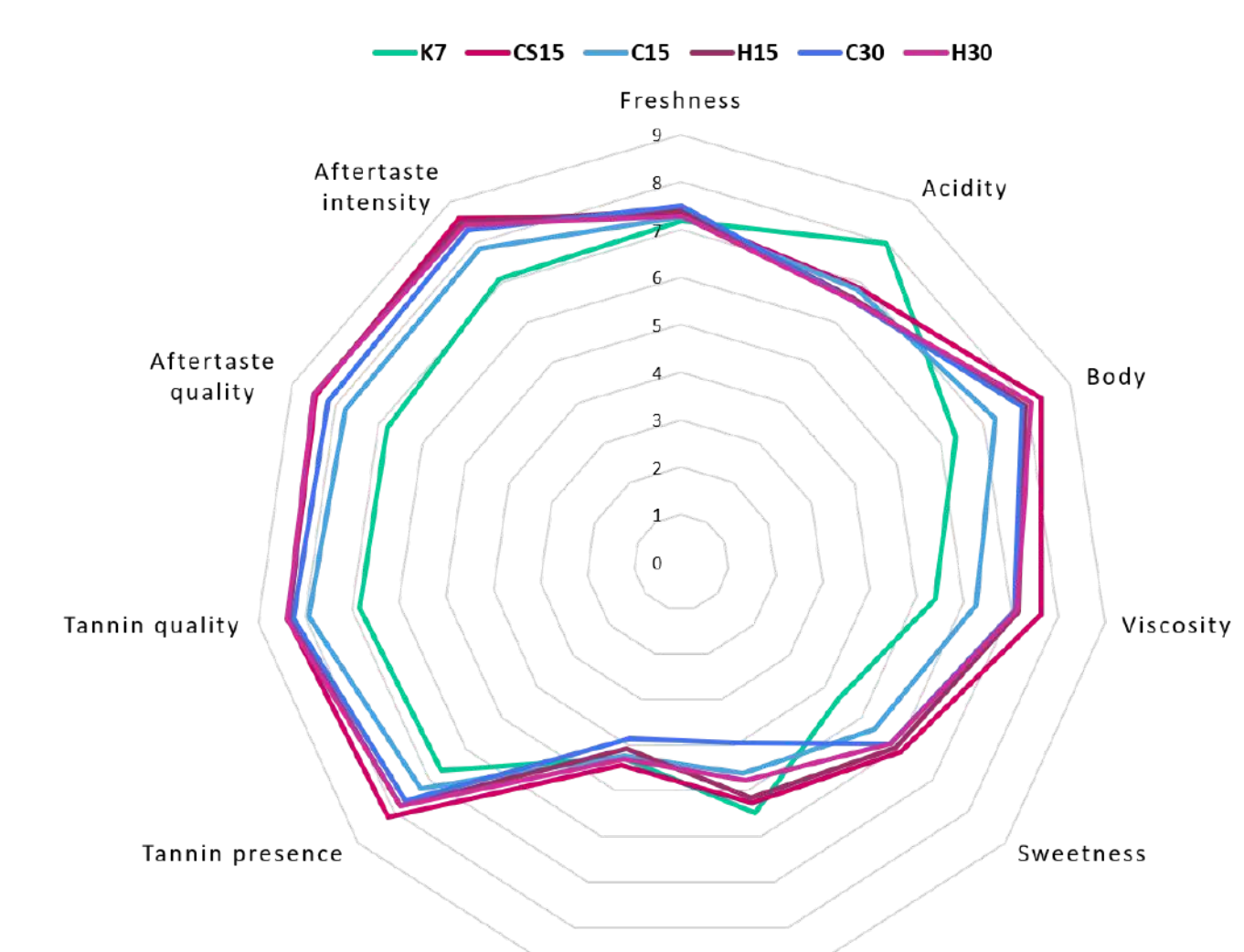
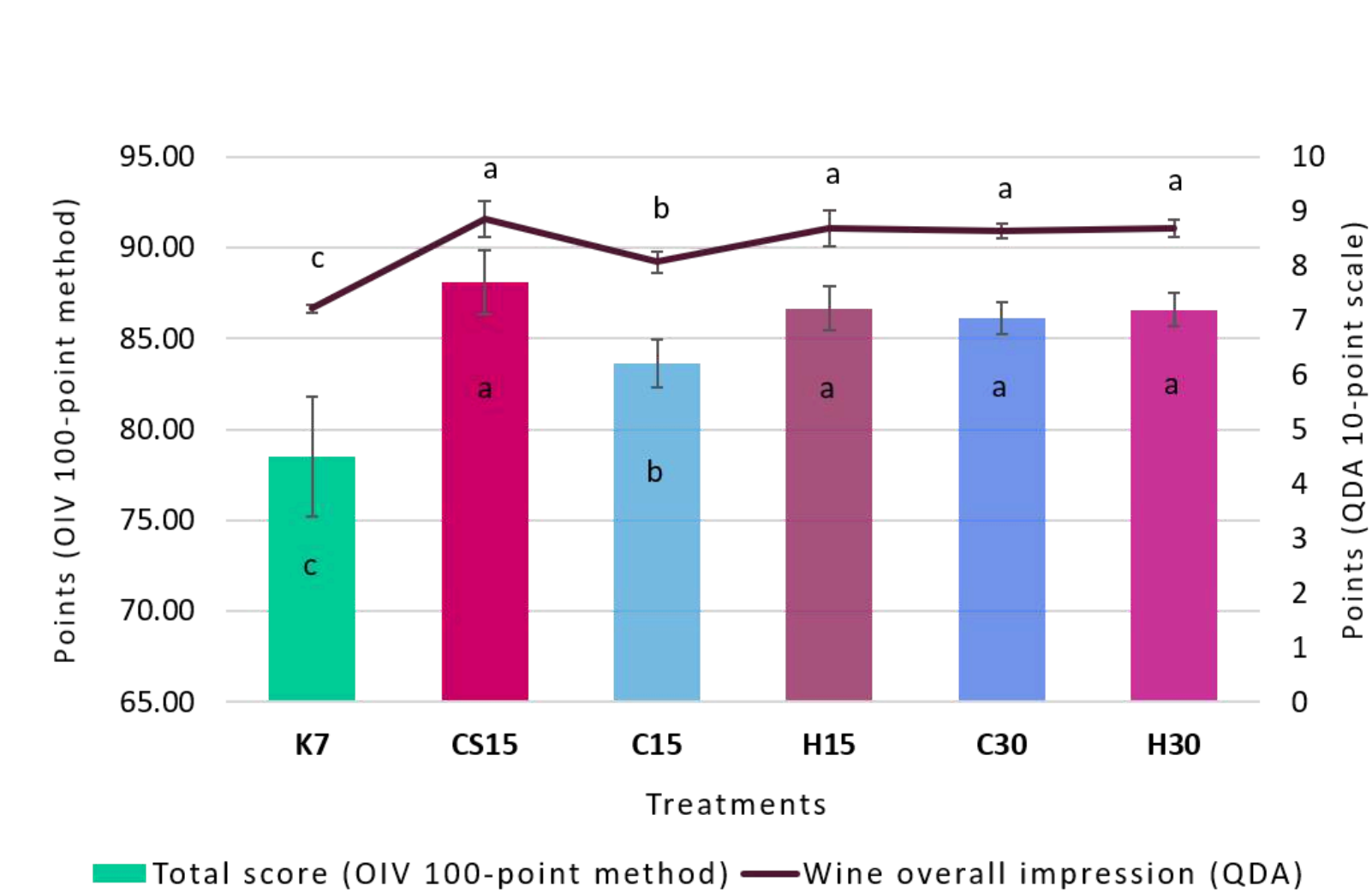


Figure 1: Total score (OIV 100-point method) and Wine overall impression (QDA) in Teran red wines

Figure 2: Perception of taste attribute intensity in Teran red wine obtained by QDA

Figure 3 and 4: Perception of individual aroma attribute intensity in Teran red wine obtained by QDA

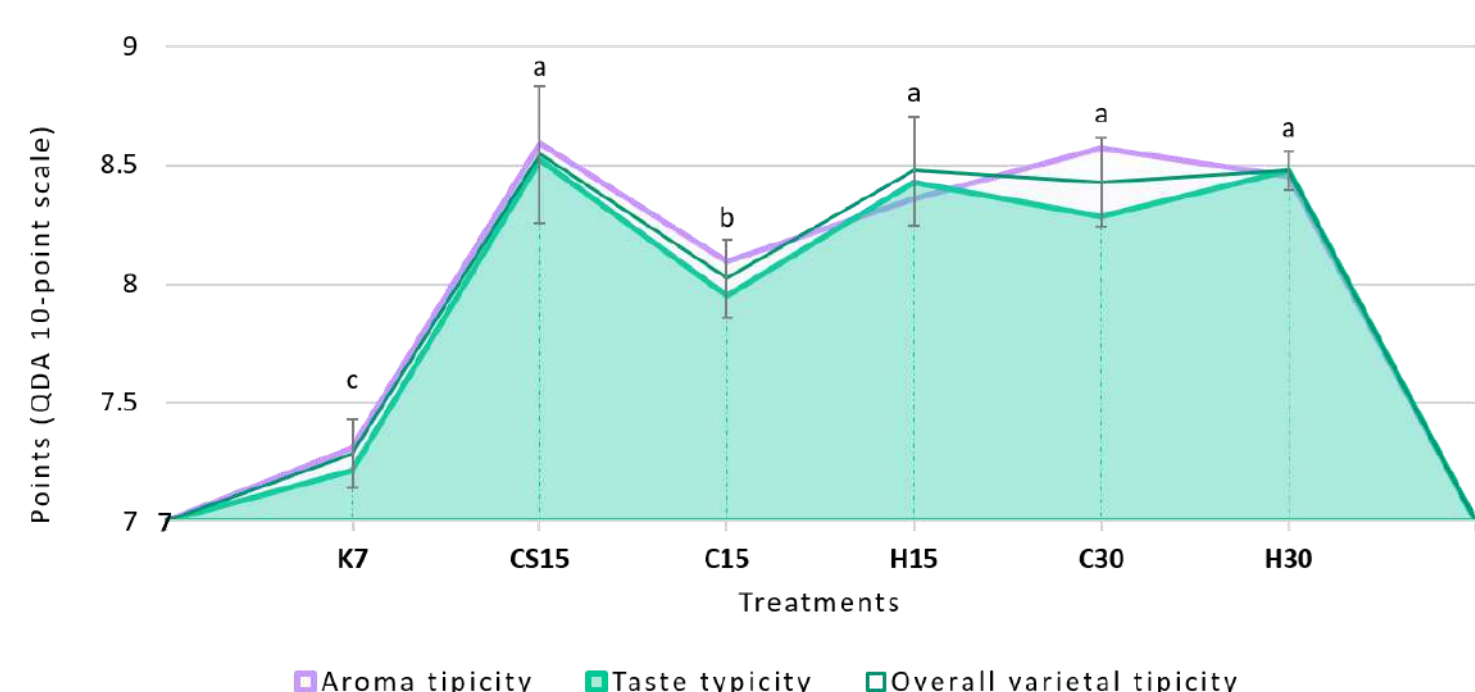


Figure 5: Perception of varietal tipicity in Teran red wine obtained by QDA

The sensory evaluation showed that CS15, H15, C30, and H30 wines were notably ranked as superior in perception of body, sweetness, viscosity, tannin presence and aftertaste quality and intensity as well as in overall quality impression in comparison to control wine. In mentioned wines the perception of red fruit aromas was the strongest followed by herbal, spicy and liquor-like aromas, while color was described as ruby-red in all wines.

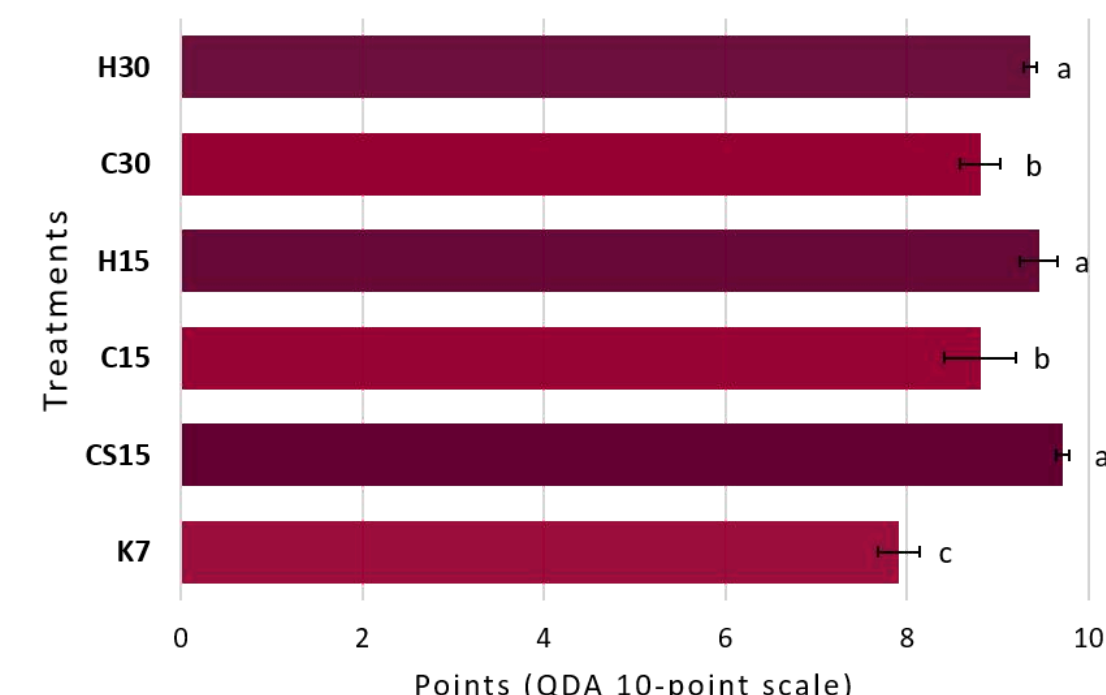


Figure 6: Perception of ruby red color intensity in Teran red wine obtained by QDA

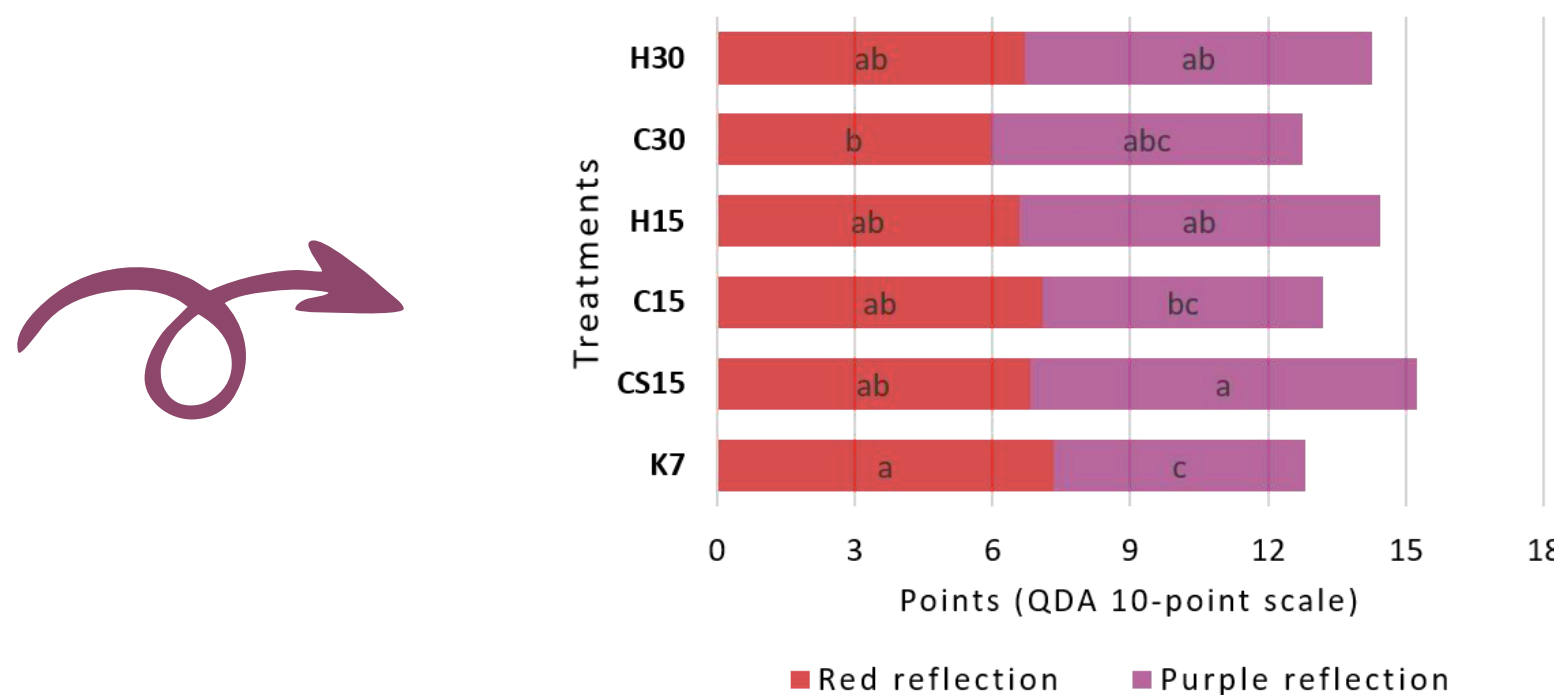


Figure 7: Perception of red and purple reflection intensity in Teran red wine obtained by QDA

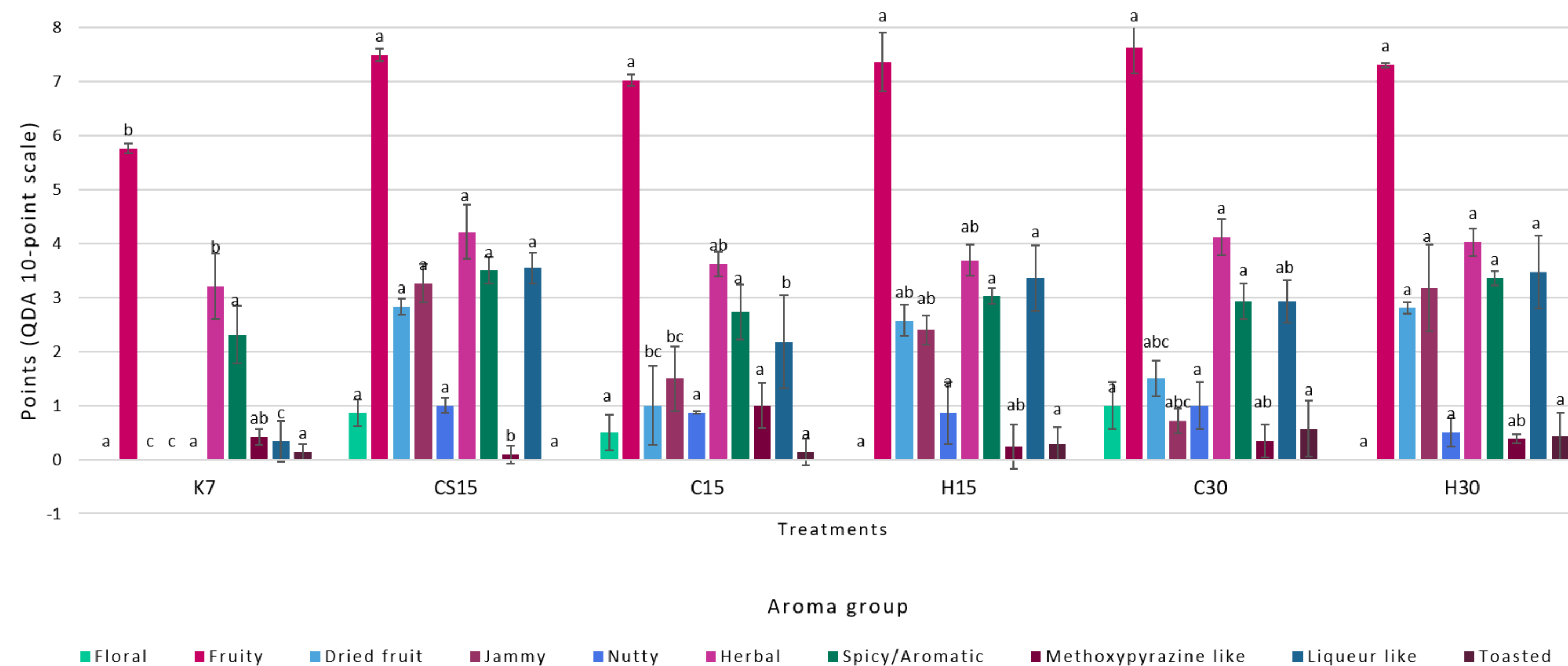


Figure 8: Perception of intensity of aroma groups in Teran red wine obtained by QDA

Lower-case letters above column represent significant differences at  $p < 0.05$  level according to the LSD test.

## Conclusions

The obtained findings imply that the investigated advanced non-standard vinification technologies, such as prolonged post-fermentative maceration along with the application of mash cooling, heating, or *saignée*, could result in diverse wines with positively altered sensory profiles, and thus allow the production of superior quality Teran red wines.

### Acknowledgements

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