

INTRODUCTION

The wine lees are the second most important wine waste product in terms of quantity after grape stalk and marc (Dimou *et al.*, 2015). It's well known that wine lees have an antioxidant action, but the chemical nature of the compounds involved in this behavior has not been elucidated yet (Lavigne and Dubourdiou, 1996). In this context, we propose a new approach to obtain antioxidant products from white wine lees for the first time.

The present study develops the valorization of white wine lees by optimising a solvent-free extraction process by water and sub critical water. The evaluation of extracts composition as well as their antioxidant capacity was performed.

METHODS

Raw material :

Lees from Sauvignon-Sémillon white wine (2020) from AOC Pessac-Léognan (France).

1. Evaluation of impact extraction operating conditions on extraction yield et antioxidant activity :

- Impact of the solvents: Water at 100°C, Ethanol 50% (1:1), Subcritical Water (SW) at 100 bars and 100°C.
- Optimised operating conditions applied in the study : initial lees concentration 10 g/L and 15 min of extraction

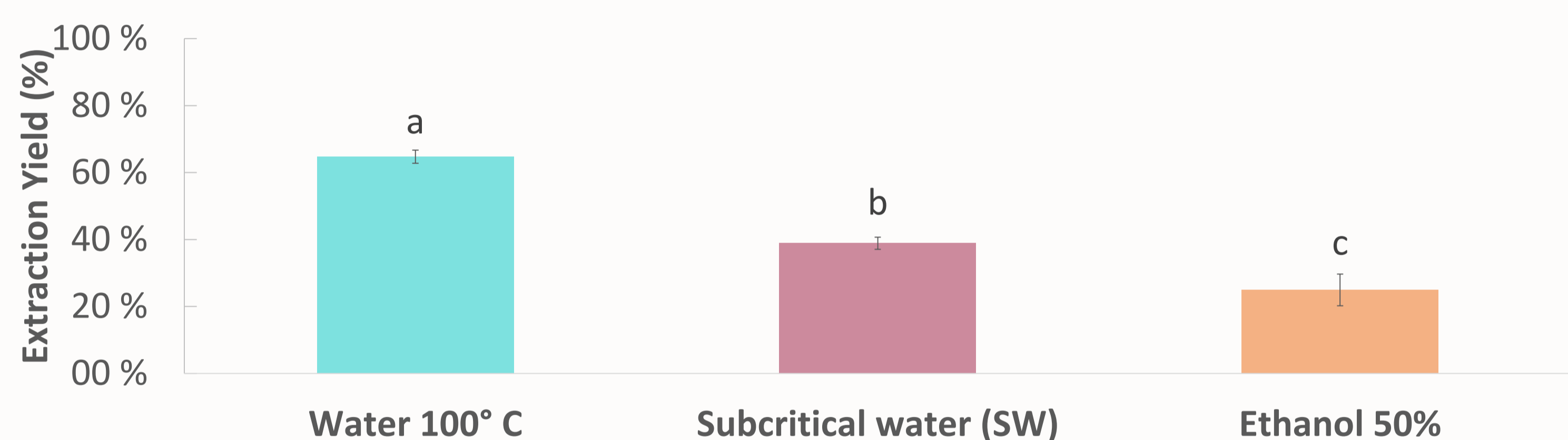
2. Evaluation of total polyphenols contents :

- By colorimetric method (Folin)
- by HPLC – MS

3. Evaluation of the antiradical activity : DPPH method

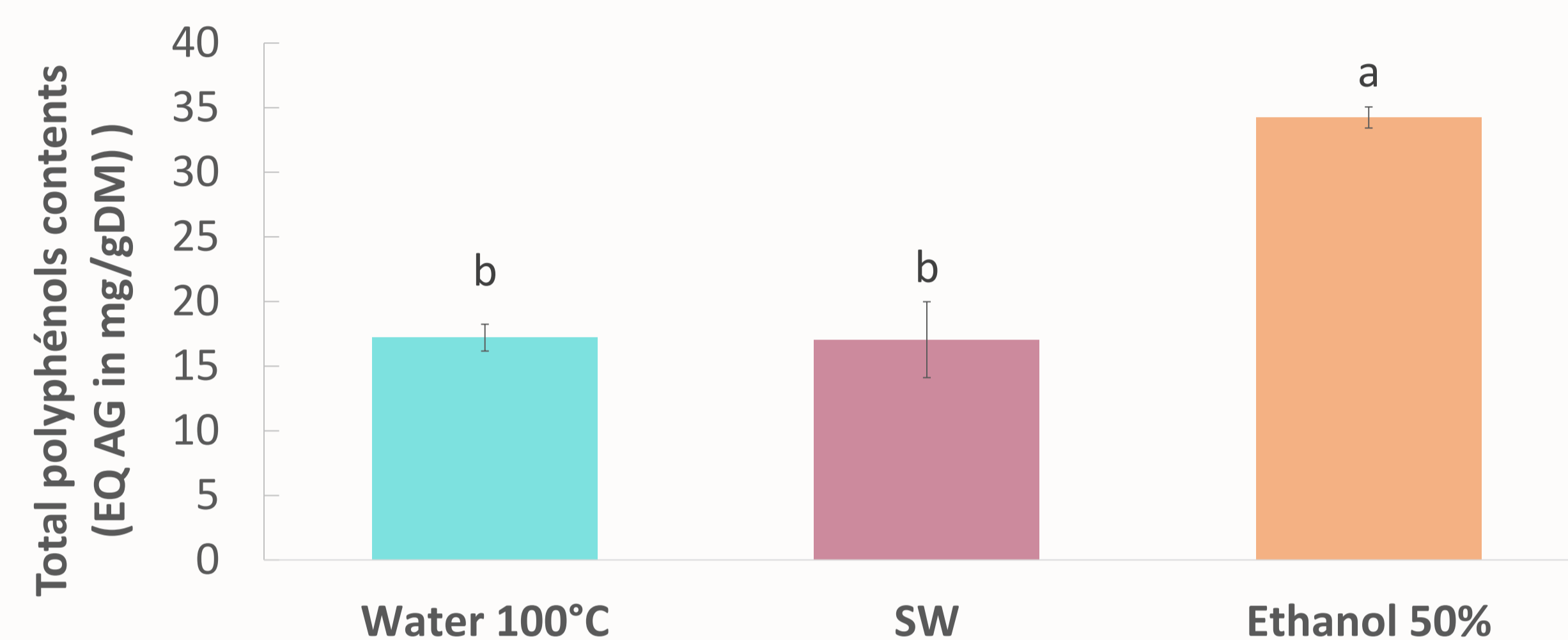
RESULTS

1. Impact of operating conditions on extraction yield



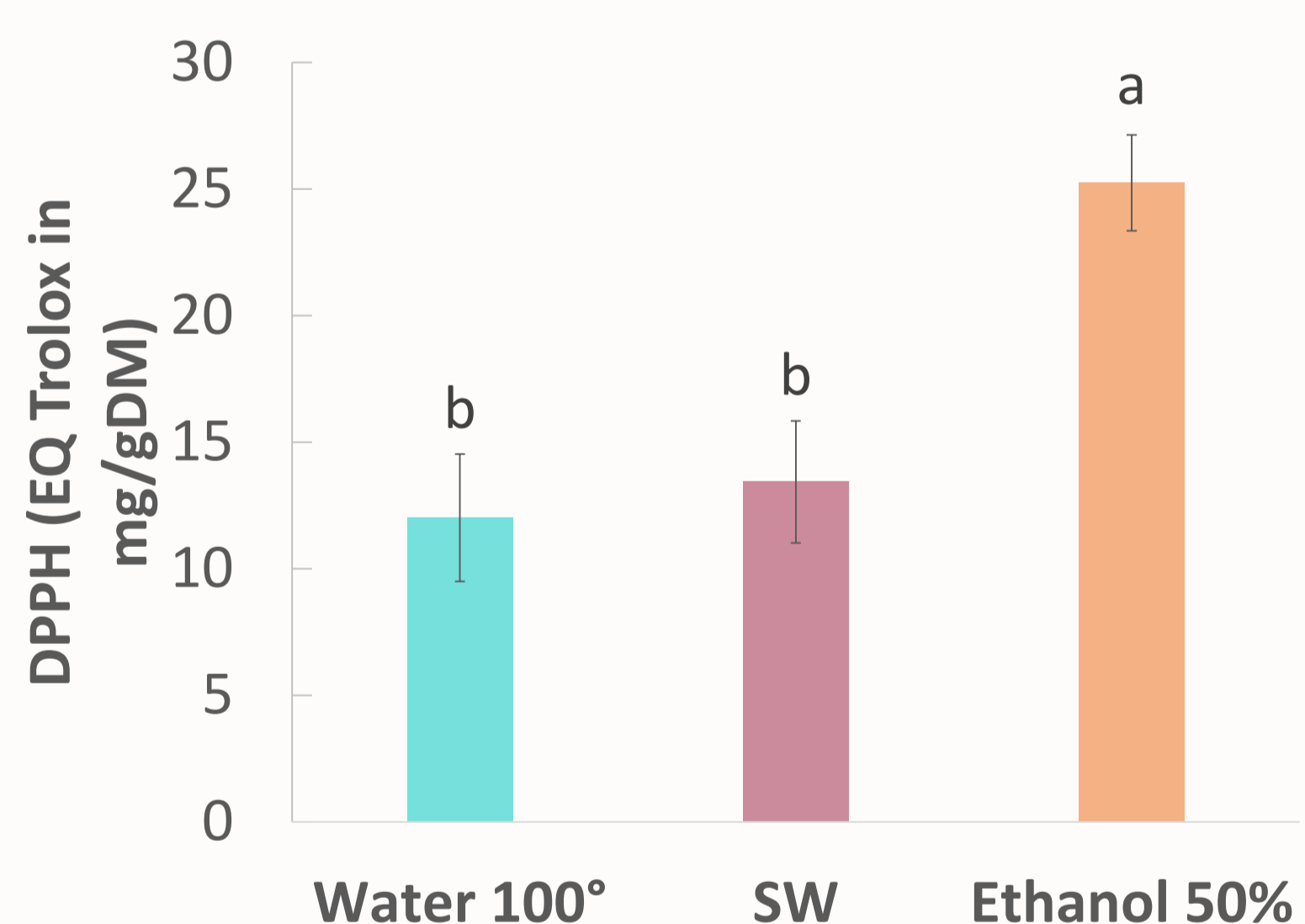
- The solvent has an impact on the extraction yield.
- **Extraction by water 100°C and Subcritical Water (100 bar and 100°C) allows a better extraction yield** compared to ethanol 50% extraction.

2. Evaluation of the polyphenols content of extract

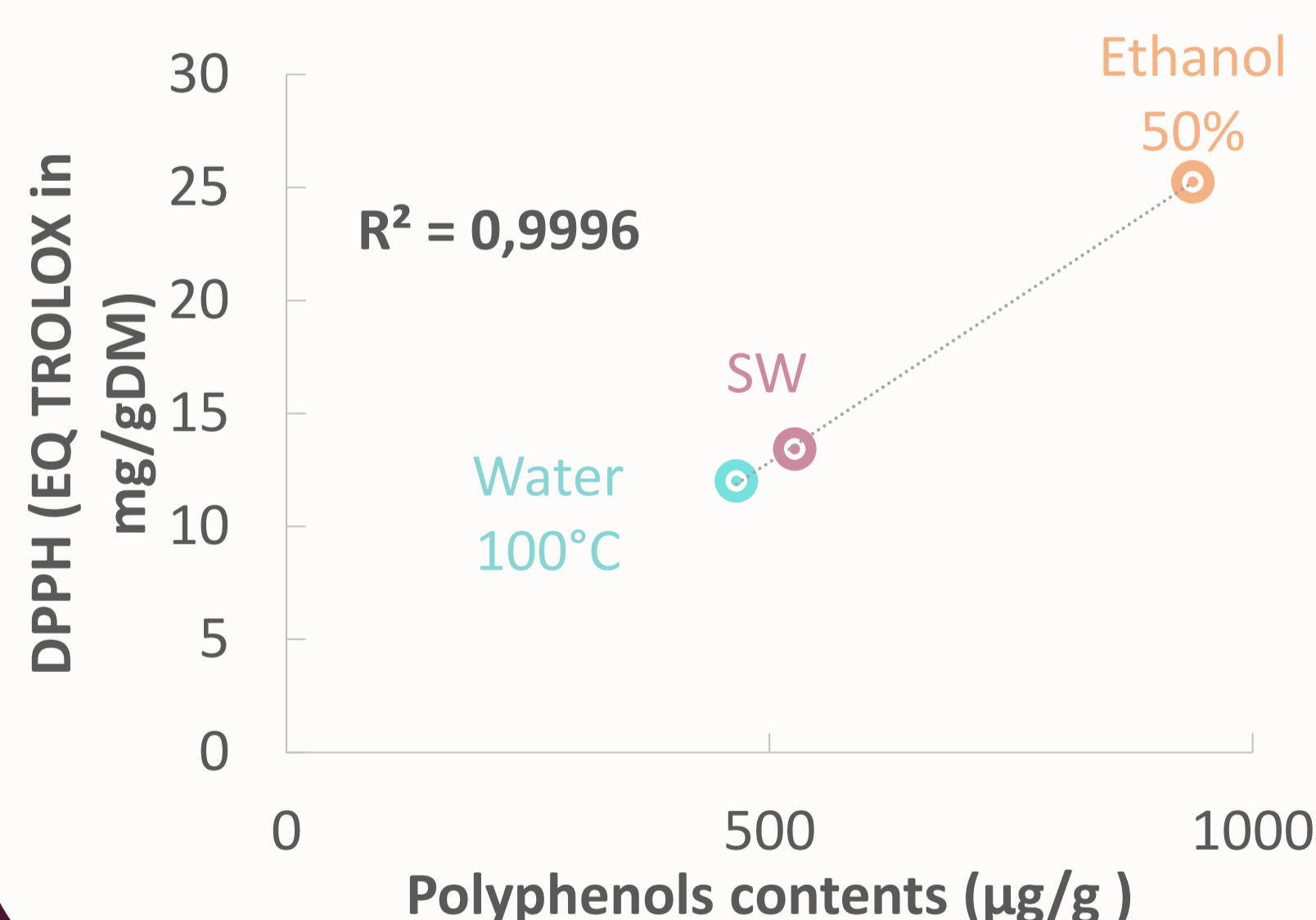


- Ethanol extraction allows a better extraction of polyphenols.
- Extraction by water at 100°C and by Subcritical Water favors polyphenols extraction.

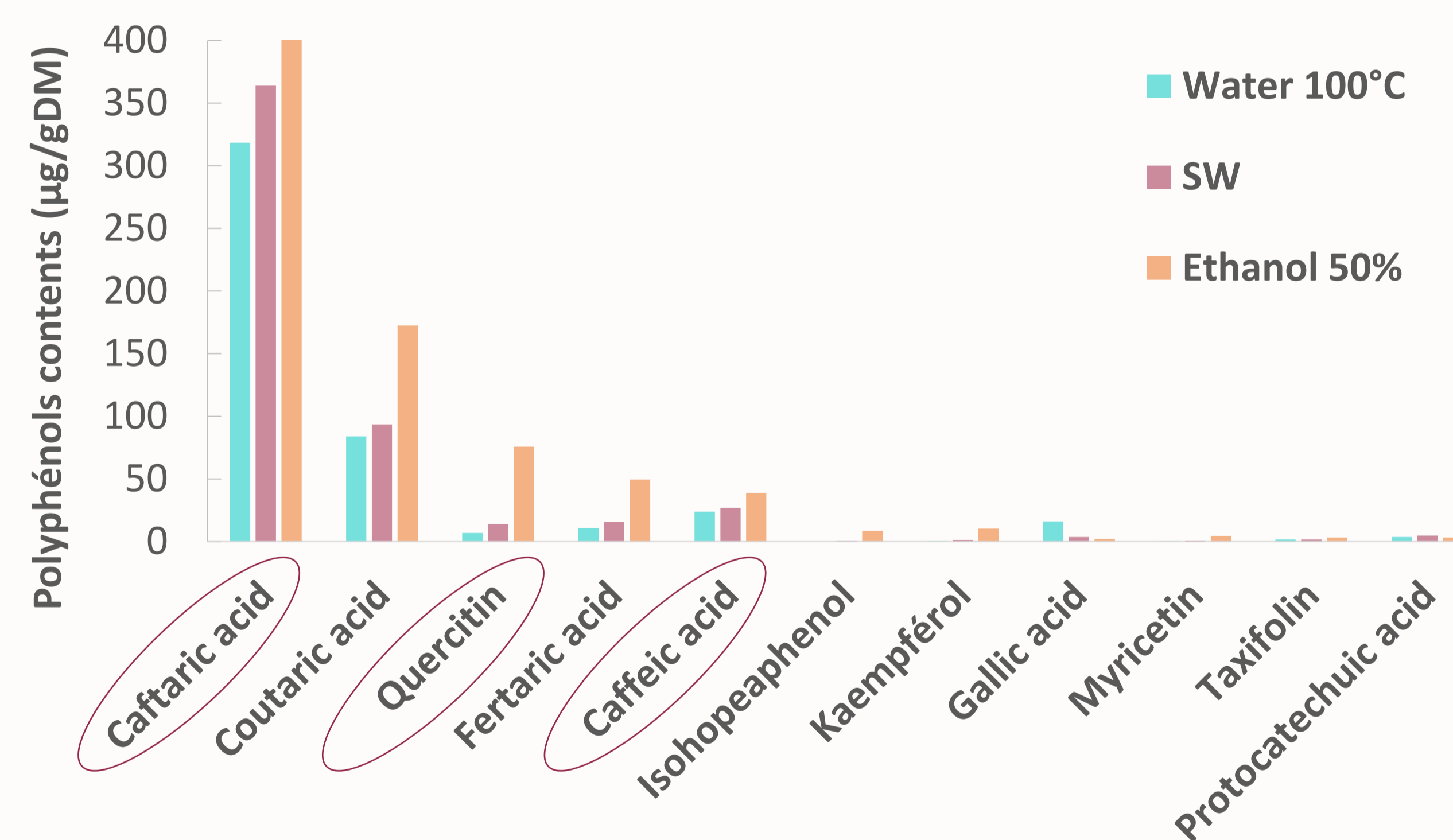
3. Evaluation of the antioxidant capacity :



- Ethanol extraction allows a better antiradical activity
- Water at 100°C and SW extractions are **favourable to obtain extracts with higher antiradical activity**



Positive correlation between the **polyphenols** contents (HPLC-MS) and the **antiradical capacity** of the extracts (DDPH) ($R^2 = 0.99$)



The extracts are mainly composed of various families of polyphenols known for their antioxidant capacity: **caftaric acid, caffeic acid and quercetin**.

CONCLUSION

For the first time, an eco-sustainable approach has been proposed for the valorization of white wine lees to obtain extracts with antioxidant activity. The lees extracts were found to be rich in polyphenols. Extract obtained by subcritical water has antioxidant capacities but lower than extracts obtained by conventional solvent. Optimisation of extraction operating conditions by green solvents could improve antioxidant properties. These preliminary results are promising to valorize white wine lees in foods, beverages and pharmaceuticals.

REFERENCES

- C. Dimou, N. Kopsahelis, A. Papadaki, S. Papanikolaou, I. K. Kookos, I. Mandala, A. A. Koutinas, Food Res. Int. (2015) 81-87.
V. Lavigne et D. Dubourdiou, J. Int. Sci. Vigne Vin. (1996), 30, n04, 201-206