

PRELIMINARY STUDIES ON THE EXTRACTION OF HYDROXYTYROSOL AND DERIVATIVES FROM OLIVE LEAVES OF PORTUGUESE CULTIVARS

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Introduction

Hydroxytyrosol (HT) and derivatives, mainly found in the leaves of the *Olea europaea* tree, have been recognized by the European Food Safety Authority (EFSA) as promoters of a cause-effect relationship which protects the low-density lipoproteins (LDL) from oxidative damage. Presently HT is used in food and cosmetic industries but only in small scale, due to its high costs.

In Portugal, the olive leaves are a by-product of pruning and mechanical harvesting of olives, reaching about 10% by weight of harvested olives. An optimized extraction process for HT and derivatives combining low energy costs and low toxicity solvents could become a competitive alternative.

Methods

Olive leaves of Cobrançosa, Galega Vulgar and Cordovil de Serpa varieties with eight years old were collected in November and March. Samples were collected considering their position to sunlight. After drying at 50 °C and scrunching with an electric mill, extractions were performed with ethanol/water (three successive extractions, 12 hours each at room temperature) (Fig. 1). The quantification of total phenols was performed via Folin-Ciocalteu reaction (Fig. 2).



Fig. 1 – Extractions at room temperature



Fig. 2 – Samples before (A) and after (B) the Folin-Ciocalteu reaction

Results and Discussion

The time of year significantly influenced the percent extracted by ethanol and also the concentration of phenolic compounds (Figs 3 and 4), in accordance with Italian and Greek varieties that have been recently studied [1, 2], although these authors found different results. Regarding the months November and March, and the Portuguese varieties studied, Cobrançosa presented the highest amount of phenolic compounds (mg/g), in November.

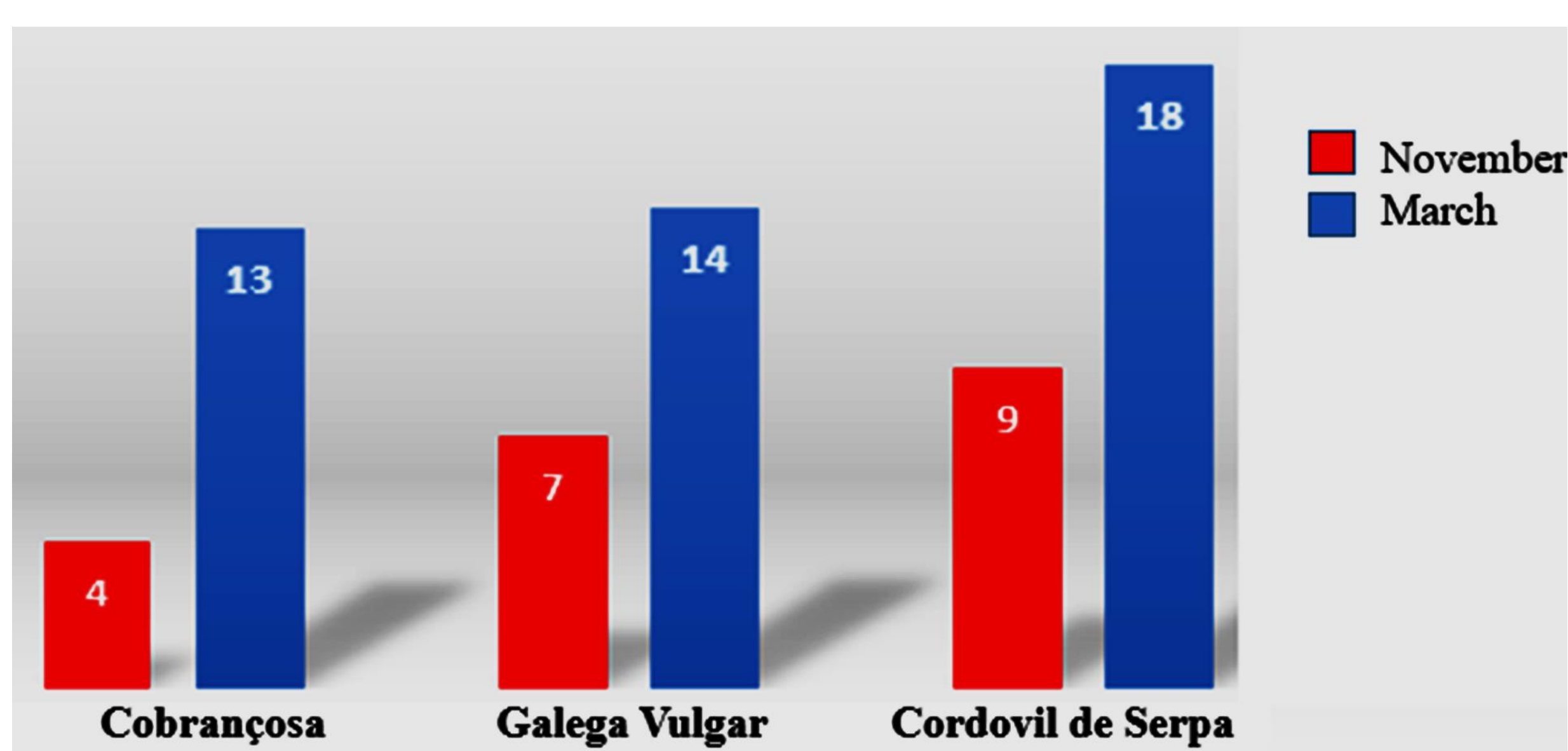


Fig. 3 – Ethanol soluble compounds (% w/w)

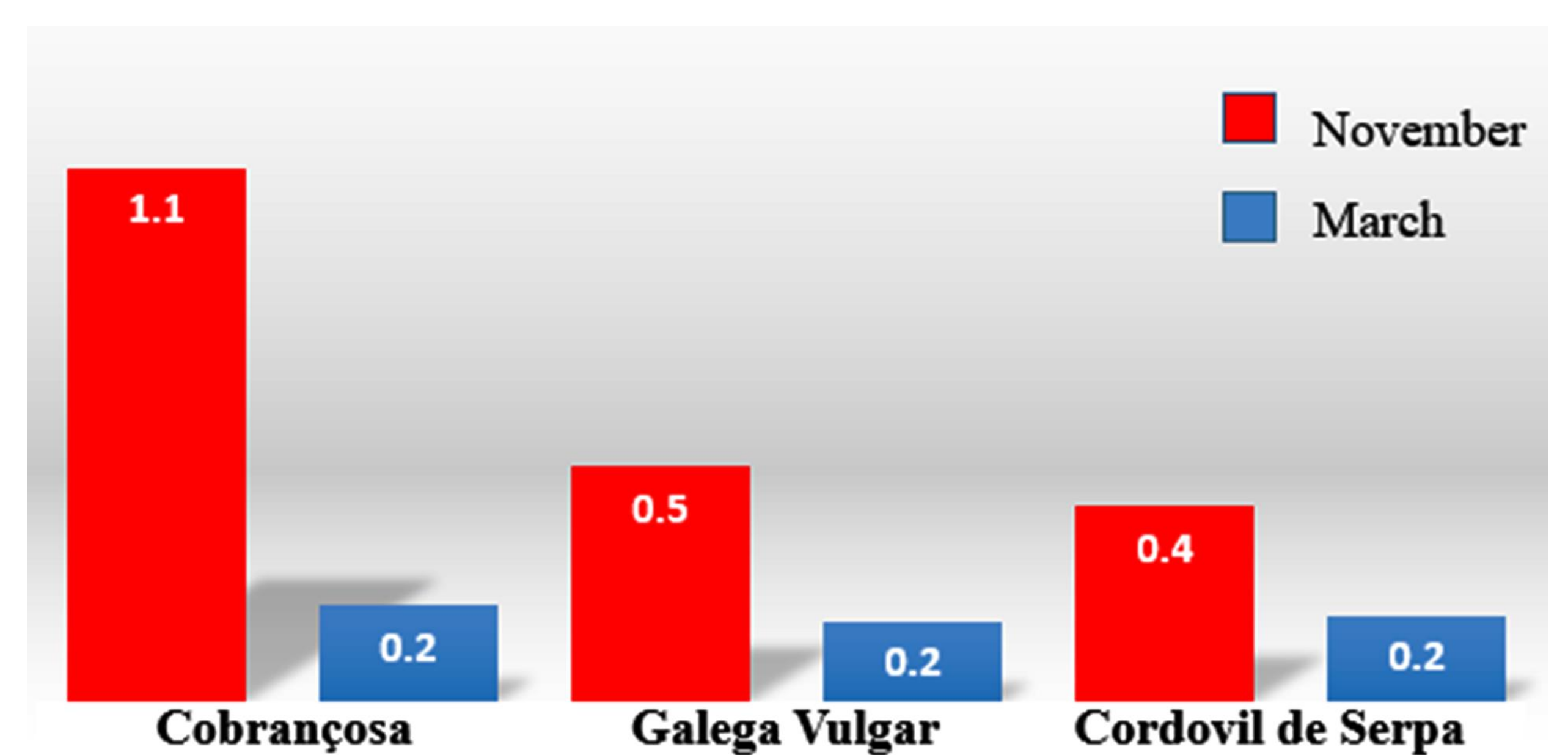


Fig. 4 –Folin-Ciocalteu positive compounds (mg/g)

Conclusion

Preliminary results showed different amounts of total phenolics and antioxidant activity in different varieties for the same sampling day ($P < 0.05$). In opposition, the same tree presented very similar results ($P > 0.05$), regardless the sun exposition.

References

- [1] Blasi, F., Urbani, E., Simonetti, M. S., Chiesi, C. & Cossignani, L. (2016). Seasonal variations in antioxidant compounds of *Olea Europaea* leaves collected from different Italian cultivars. *Journal of Applied Botany and Food Quality*, 89, 202-207
- [2] Mitsopoulos, G., Papageorgiou, V., Komaitis, M. & Hagedimitriou, M. (2016). Total Phenolic Content and Antioxidant Activity of Leaves and Drupes in Major Greek Olive Varieties. *Not Bot Horti Agropo*, 44 (1): 155-161.

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