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VALORIZATION OF UNHARVESTED GRAPES FROM THE DOURO SUPERIOR SUB-REGION (PORTUGAL): FATTY ACID AND VITAMIN E PROFILES OF THREE RED GRAPE VARIETIES



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• Introduction [1]



Douro wine region (Northern Portugal)

Facing economic and environmental challenges, including:

- **Declining wine consumption** — Lower demand in the market
- **Wine surpluses** — More wine than the market can absorb
- **Rising production costs** — Higher costs for growers and wineries
- **Competition from low-price imports** — Increased pressure on local producers
- **Volatile market trends** — Uncertainty and price fluctuations



Unharvested grapes left in the vineyard

Not economically viable for growers and wineries

Risk of abandonment and environmental impacts

Exploring alternative valorization pathways for these grapes may contribute to a more sustainable and circular viticulture sector.

AIM: to characterize tree red grape varieties (Touriga Nacional, Sousão, and Tinta Roriz) from the Douro Superior sub-region in terms of their vitamin E and fatty acid profiles.

• Material and method

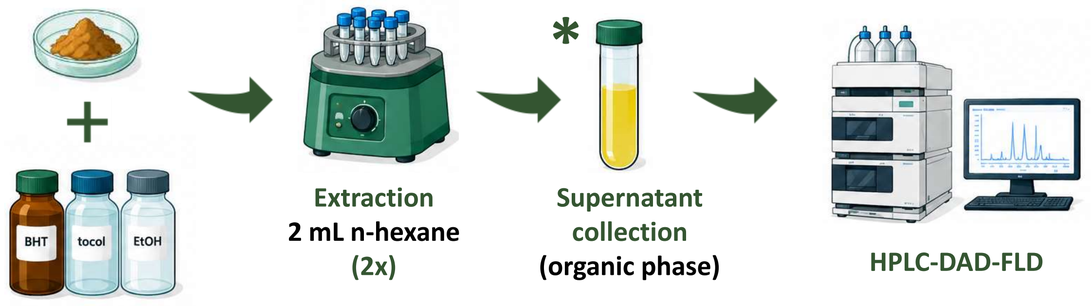
1 Soxhlet extraction

(AOAC 991.36)

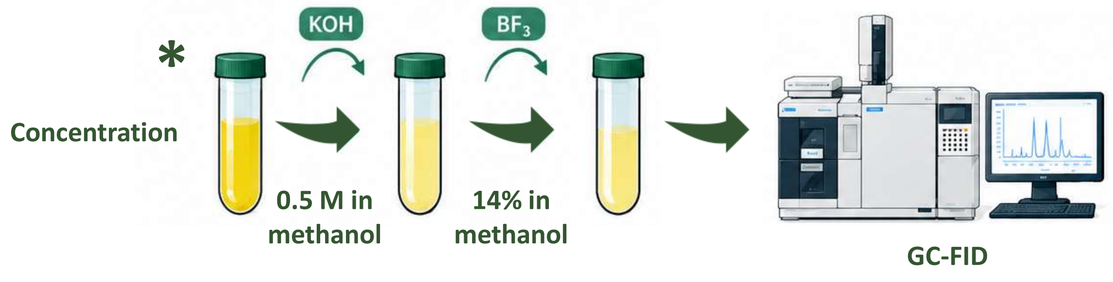


2 Lipid profile: cold extraction [2]

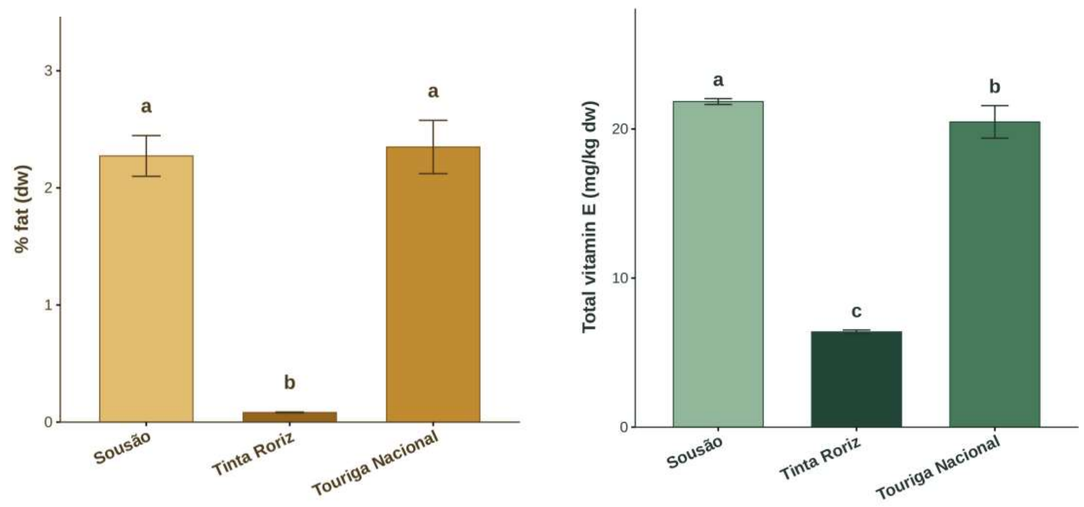
3 Vitamin E profile [2]



4 Fatty acid profile [3]

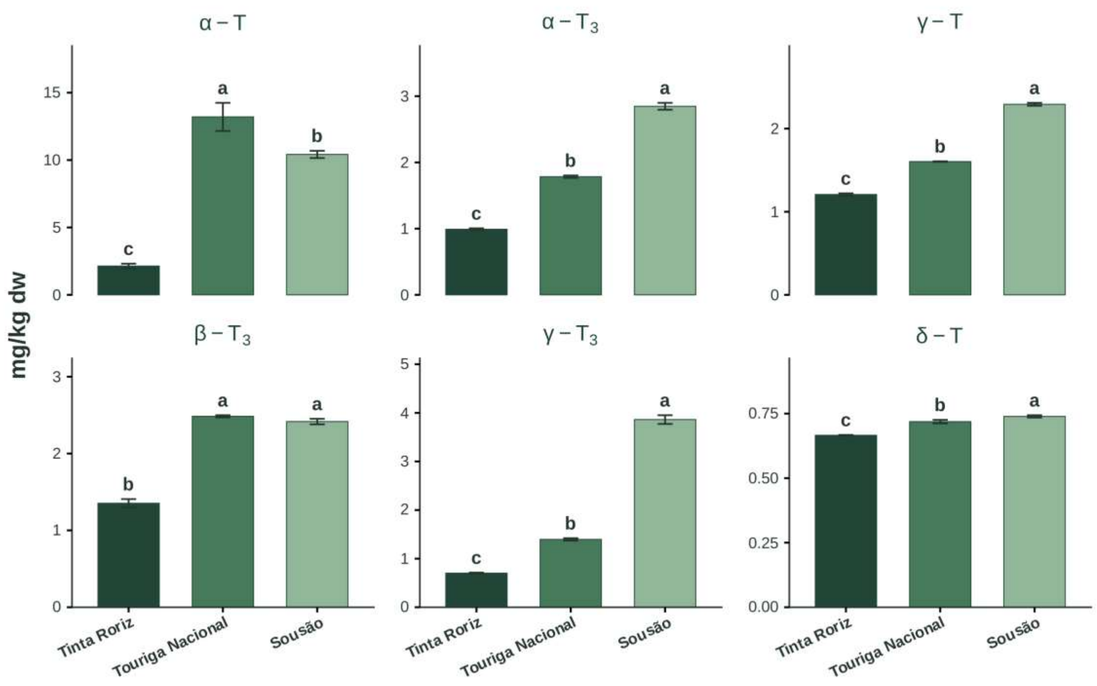


• Results and discussions



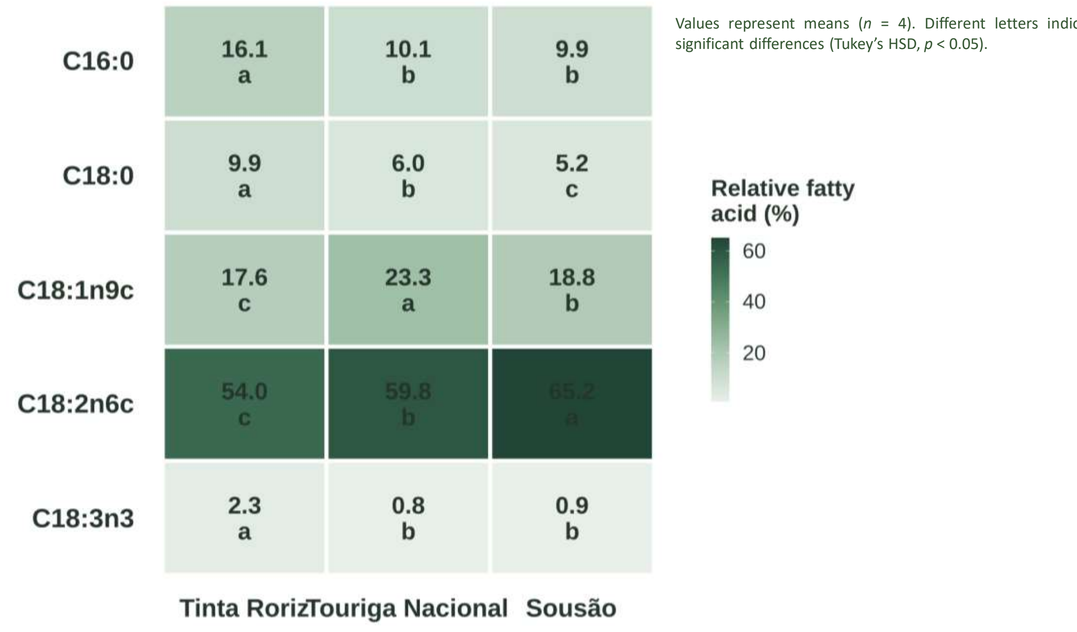
Values are expressed as mean ± SD (n = 4). Different letters indicate significant differences between grape varieties (Tukey's HSD, $p < 0.05$).

VITAMIN E PROFILE



Values are expressed as mean ± SD (n = 4). Different letters indicate significant differences between grape varieties (Tukey's HSD, $p < 0.05$).

FATTY ACID PROFILE



Values represent means (n = 4). Different letters indicate significant differences (Tukey's HSD, $p < 0.05$).

• Conclusions

Overall, Touriga Nacional and Sousão grapes exhibited higher total vitamin E levels and fat contents than Tinta Roriz, suggesting their potential as sources of lipophilic compounds for further investigation in food and cosmetic applications.

- **Touriga Nacional and Sousão** showed **higher fat contents** than Tinta Roriz.
- **Six vitamin E vitamers** were identified, with **α-tocopherol** as the most abundant. **Sousão** and **Touriga Nacional** showed **higher total vitamin E contents** than Tinta Roriz.
- **Linoleic** and **oleic acids** were the predominant fatty acids.

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