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Metabolomic approach in *Vitis vinifera* varieties with different stress tolerance in Alentejo region

Lénia Rodrigues[1*], Mónica Soeiro[2], Marta Sousa Silva[2], Carlos Cordeiro[2], João Mota Barroso[3], Ana Elisa Rato[3*]

[1]MED (Mediterranean Institute for Agriculture, Environment and Development) & CHANGE – Global Change and Sustainability Institute, IIFA (Instituto de Investigação e Formação Avançada), Universidade de Évora, Pólo da Mitra, Ap. 94, 7002-554 Évora, Portugal.
[2]Laboratório de FTICR e Espectrometria de Massa Estrutural, Biosystems and Integrative Sciences Institute (BioISI), Faculdade de Ciências, Universidade de Lisboa, Campo Grande, 1749-016 Lisboa, Portugal.
[4]MED (Mediterranean Institute for Agriculture, Environment and Development) & CHANGE — Global Change and Sustainability Institute, Escola de Ciências e Tecnologia, Departamento de Fitotecnia, Universidade de Évora, Pólo da Mitra, Ap. 94, 7006-554 Évora, Portugal.

liar@uevora.pt; aerato@uevora.pt

INTRODUCTION & AIM

Grapevine (*Vitis vinifera* L.) is globally recognized as the most extensively grown and economically significant crop, primarily due to its association with the wine industry. This species posses a remarkable ability to adapt to various abiotic stresses, like extreme temperatures or UV radiation, and the response is determined by several regulatory mechanisms, with changes in metabolite composition.

Metabolomics is an omics technology that holds promise in agricultural research, becoming an indispensable tool in various plant sciences studies, such as to elucidate adaptive responses under abiotic stresses for use in crop improvement.

In this study, different grapevine cultivars were distinguished using metabolomics tools and the active role of metabolites under heat stress conditions was also elucidated.

METHODOLOGY

Plant material

- Leaves from three different red wine varieties (cv. 'Aragonês' (ARA), 'Trincadeira' (TRI) and 'Touriga Nacional' (TN) were collected from field-growing plants at five different time points during ripening, under high summer temperatures.

- Leaves were homogeneized with liquid nitrogen.

Metabolite extraction

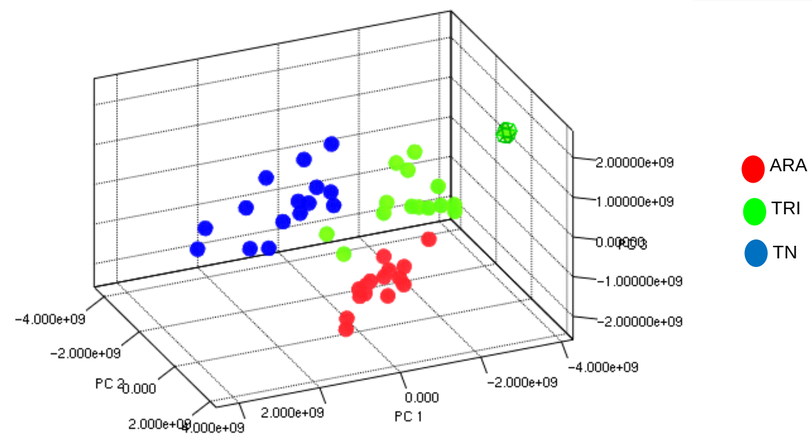
- Metabolite extraction was performed using 100 mg of ground leaves with 1 mL methanol/water (1:1), followed by 3 cycles of vortex / ice for 1 min each.
- After centrifugation, the supernatant containing the metabolites was recovered and analysed by **FT-ICR-MS.**

FT-ICR-MS analysis

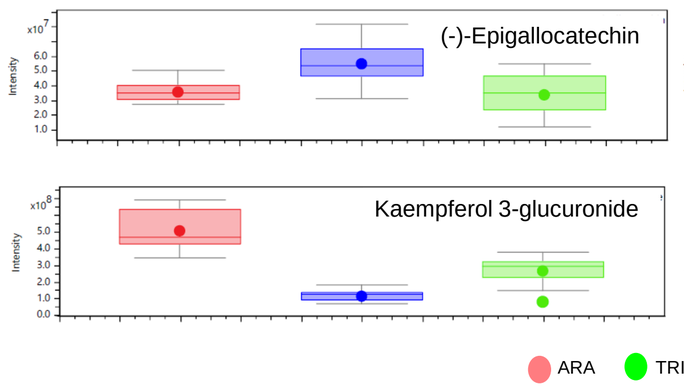
- The samples were diluted in 1:1000 in methanol/water (50%/50%, v/v) and 0.1% (v/v) of formic acid.
- The metabolite extracts from the different *V. vinifera* cultivars were analysed by FT-ICR-MS following an **untargeted metabolomics approach**.

RESULTS & DISCUSSION

It was possible to distinguish the three *Vitis vinifera* cultivars through metabolome profiling (PCA).



Some flavonoids' are differentially present in the grapevine's cultivars.



CONCLUSION

Metabolomics can be utilized as a phenotyping tool for distinguishing cultivars and elucidate the mechanisms that confer tolerance to hight temperatures in grapevine.

ACKNOWLEDGMENTS

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