MICRO BIOTEC 25

CONGRESS OF MICROBIOLOGY
AND BIOTECHNOLOGY 2025

04/05/06 DECEMBER 2025

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DOS AÇORES

ABSTRACT BOOK

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SPM
Sociedade Portuguesa de Microbiologia

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MB 25

ID681 | *Arthrobacter nicotinovorans* EAPAA enhances must attributes: evidence from Spanish and Portuguese case studies

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Background: Mediterranean agriculture faces severe challenges from soil degradation and water scarcity, intensified climate change, and unsustainable practices, like the overuse of chemicals. These pressures drive biodiversity loss, soil erosion, and declining crop productivity, threatening food security and farming's long-term viability. Enhancing resilience in agri-food systems requires the combination of sustainable agronomic practices and innovative biotechnological solutions. Among these, the use of plant-growth-promoting bacteria (PGPB) is a currently sought strategy to support crop performance. Despite their proven benefits under controlled conditions, it is essential to widen the assessment of PGPB robustness and stability in real-world situations.

Methods: Two case studies in Ribeiro (Spain) and Douro (Portugal) evaluated the effects of Arthrobacter nicotinovorans EAPAA inoculation on grapevine (Vitis vinifera L.), focusing on must quality and soil properties. The strain EAPAA has been shown to enhance P solubilization and N2 fixation. Field trials covered an average area of 300 m2 in Spain and 600 m2 in Portugal.

Results: Must composition analysis show that inoculation significantly affected sugars and organic acid levels in both sites. In Spain, inoculation increased glucose and fructose by 18% and 31%, respectively; tartaric and malic acid by 17.5% and 9.2%, respectively, and succinic acid by 29.8%-71.3%, alongside higher soil P available, labile C compounds, and biological activity. In Portugal, sugars increased by 33% and tartaric and malic acids by 50%, improvements that directly influence the quality of the wine.

Conclusion: This study demonstrates the adaptability of A. nicotinovorans EAPAA and its beneficial effects on both must quality and soil health.

Acknowledgments: This work was supported by the Agroecology Partnership Project VinAE–Vineyards network for co-creation and expansion of AgroEcological strategies to face viticulture challenges: a basis for cross-border living labs (AgroEco/0002/2024), exclusively financed by national funds through FCT and the Spanish AEI (Ref. PCI2025-163147, MICIU/AEI/10.13039/501100011033/UE). The authors thank CBQF scientific collaboration under the FCT project UIDB/50016/2020. A. Sousa thanks the FCT grant (2024.15499.PRT) for the financial support. S. Pereira thanks FCT Assistant Researcher contract (2023.15056.TENURE.047) through FCT-TENURE Program funded by the Recovery and Resilience Plan (PRR).