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The **Universitat Politècnica de València (UPV)** is a leading

technological university internationally recognised for excellence in research, innovation, and education. Ranked as the top technological university in Spain and

consistently among the top 500 universities worldwide, UPV provides a highly competitive scientific environment, advanced research infrastructure, and strong international collaborations, ensuring excellent capacity to support cutting-edge agricultural and biotechnological research.

The UPV team, based at the Department of Biotechnology and Plant Production and COMAV, includes Prof. Ana Maria Fita Fernández (ORCID: 0000-0002-8637-5852), Prof. Adrián Rodríguez Burruezo (ORCID: 0000-0002-4530-8071), and Dr Claudia Pallotti (ORCID: 0000-0002-5231-4285). The team integrates complementary expertise in plant breeding, genetics, and crop adaptation. The group has participated in nearly 100 national and international



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projects, including major EU-funded initiatives such as H2020 LIVESEED, LIVESEEDING, and BRESOV, and maintains active collaborations with leading institutions worldwide. Their scientific excellence is demonstrated by nearly 200 SCI-indexed publications, more than half in Q1 journals, including over 75 in the last five years. The team also has strong experience in knowledge transfer, industry collaboration, and training of early-career researchers.

Principal Investigator:

Professor Ana Fita leads the Abiotic Breeding Group at COMAV-UPV and is an internationally recognised expert in breeding crops adapted to abiotic stress. Her research focuses on identifying genetic resources and mechanisms for tolerance to salinity, drought, and low-input conditions, particularly in Solanaceae and Brassica crops. She has led multiple competitive projects and participated in 47 research projects, producing 78 JCR publications, mainly in high-impact journals. Her expertise includes advanced phenotyping, genotyping, transcriptomics, and metabolic profiling for crop improvement.



Professor Fita also plays a key role in capacity building as Academic Director of the 'Master in Plant Breeding' and the Erasmus Mundus 'emPLANT' programme, supervising MSc and PhD students and maintaining strong international collaborations. Her scientific leadership, combined with the institutional excellence and multidisciplinary expertise of the UPV team, ensures outstanding capacity to successfully implement high-impact research projects in plant breeding and crop adaptation.

More info at: <https://www.upv.es/ficha-personal/anfifer>

Main task in the project:

UPV is responsible for supporting several scientific and technical activities across three project milestones, which focus on the phenological, physiological, microbiological, and nutritional characterisation of sorghum in Spain within a broader EU research framework.

During Milestone I, the main activities include preparing a comprehensive report on the relevance of sorghum cultivation in Spain, including agronomic practices and varieties cultivated, and contributing to EU-level reporting on sorghum production. UPV will engage Spanish sorghum farmers, support the establishment of a European sorghum stakeholder network, and contribute to surveys and stakeholder mapping activities. In addition, soil, rhizosphere, and root samples will be collected from selected sorghum fields representing different soil types and varieties. These samples will be used for microbiome, DNA, and physicochemical analyses. UPV will also perform nutrient composition analyses of sorghum grain samples, including sugars, starch, proteins, minerals, tannins, and lipids, while additional grain samples will be provided for mycotoxin and fungal microbiome analyses.

Milestone II focuses on the isolation and characterisation of plant growth-promoting bacteria (PGPB) and the evaluation of their short-term effects on sorghum growth under controlled phytotron conditions. UPV will conduct inoculation experiments using bacterial strains provided by the Client and evaluate plant performance through root architecture analysis, biochemical assessments, oxidative stress markers, antioxidant activity, and agronomic growth parameters such as biomass, height, and stem diameter. Results will contribute to optimisation studies of beneficial bacterial strains for sorghum cultivation.

Milestone III addresses the long-term effects of selected PGP bacterial strains on sorghum growth and productivity. UPV will conduct greenhouse pot experiments using different sorghum varieties inoculated with the most promising bacterial strains identified previously. Long-term plant performance, root characteristics, biochemical parameters, yield, and grain nutrient composition will be evaluated. Grain analyses will include the determination of sugars, starch, proteins, minerals, tannins, and lipids from experiments conducted in Spain and Hungary.

“From my perspective as a researcher, I expect this project to provide a valuable opportunity to better understand the complex interactions between sorghum plants, soil microbiomes, and environmental conditions under Mediterranean and European agricultural systems. I believe this collaboration will allow us to generate high-quality scientific knowledge while also addressing practical challenges related to sustainable crop production and climate change adaptation.

One of my main expectations is to contribute to the identification of beneficial microorganisms that can improve sorghum growth, stress tolerance, and grain quality in a more sustainable way. I am particularly interested in how plant growth-promoting bacteria can help reduce the dependence on chemical fertilisers and support more resilient agricultural practices. I also expect the project to generate valuable data on the nutritional quality and microbiological characteristics of sorghum cultivated under different environmental conditions.

Beyond the scientific results, I see this project as an important opportunity to strengthen collaboration between researchers, farmers, and institutions from different European countries. Working within an international and multidisciplinary consortium will facilitate the exchange of knowledge, methodologies, and experiences, which is essential for addressing current agricultural and environmental challenges at the European level.

For the European Research Area, I believe this collaboration can contribute to building stronger research networks focused on sustainable agriculture and climate-resilient crops.

The project may also help position sorghum as a strategic crop for Europe due to its adaptability to drought and low-input systems. In addition, the results obtained could support future research initiatives, innovative biostimulant development, and more sustainable agricultural strategies aligned with the objectives of the European Green Deal.

Personally, I hope this collaboration will lead not only to scientific publications and technical advances, but also to long-term partnerships and new research opportunities that continue beyond the duration of the project.”