Fraunhofer PORTUGAL

RESEARCH CENTER FOR ADVANCED WATER, ENERGY AND RESOURCE MANAGEMENT – AWAM

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PROJECT SPEC SHEET (EN)

NatBBac - BACTERIOCINS: NATURE-BASED SOLUTIONS TO ENHANCE FOOD QUALITY AND SAFETY

Project no: 00825700

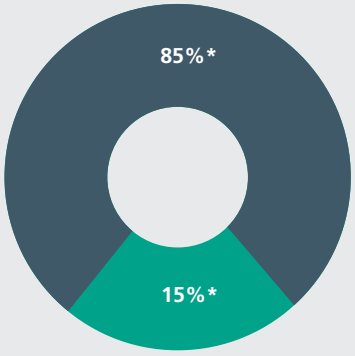
Supported by:
"COMPETE2030-FEDER": SACCCT – Projetos de Investigação Científica e Desenvolvimento Tecnológico; (IC&DT) - Operações Individuais e em Copromoção

Beneficiary entities: University of Azores; Associação Fraunhofer Portugal Research

Total eligible cost: 249.998,40 €

EU Funding: 212.498,64 € (FEDER)

National/regional funding: 28.492,56 € (DRCID*)



- COPROMOTORS FUNDING
- EU FUNDING

Project's overview

The food industry's increasing demand to extend the shelf life of food and prevent spoilage contrasts with consumer awareness of the health risks associated with the use of chemical preservatives. The use of chemically synthesized preservatives has increased in recent decades and there is ample scientific data on the intolerance of food additives promoting various health issues. The heavy reliance on these drugs has led to significant drawbacks that are driving the further development of natural antimicrobials.

New antimicrobials that do not raise safety concerns and are cost-effective would revolutionize the food industry. The bacteriocins produced by lactic acid bacteria (LAB) are natural antimicrobials that fulfil this requirement: They are generally non-toxic to eukaryotic cells and extremely effective against many food spoilage and pathogenic bacteria. However, the current application is limited due to their low efficacy in food systems and the high cost of their synthesis, which makes large-scale production unrealistic.

The main objective of NatBBac is to develop bacteriocins as a novel, safe alternative to the use of chemical preservatives in food by solving these challenges. To achieve this, a five-stage bacteriocin discovery and

Portugal | Vila Real, Évora, Açores

*Only applicable to the University of the Azores, ref. M2.2.A/COFUND PFE/004/2025.

development pipeline will be implemented. This will utilize new and existing bacteriocins isolated by the University of Azores. The novel bacteriocins will be sequenced and characterized in terms of their mode of action and safety. In addition, a method will be developed to produce food-grade bacteriocins on a large scale. This includes the fermentation of cheese whey and the production of a food-grade bacteriocin formulation using nanofiltration techniques with ceramic membranes as a strategy to overcome the difficulties of extracting primary metabolites such as bacteriocins from whey. This will pave the way for the application of bacteriocins in novel protective films to replace petroleum-based plastics in food packaging.

This project bring together the unique expertise required to carry out this project by combining basic research into the identification and characterization of bacteriocins with applied research into whey fermentation, nanofiltration and the protection of bio-based food packaging.

Keywords: Bacteriocins, Food preservatives, Cheese Whey Valorization, Wastewater Treatment, Nanofiltration

Photos, videos and other dissemination materials