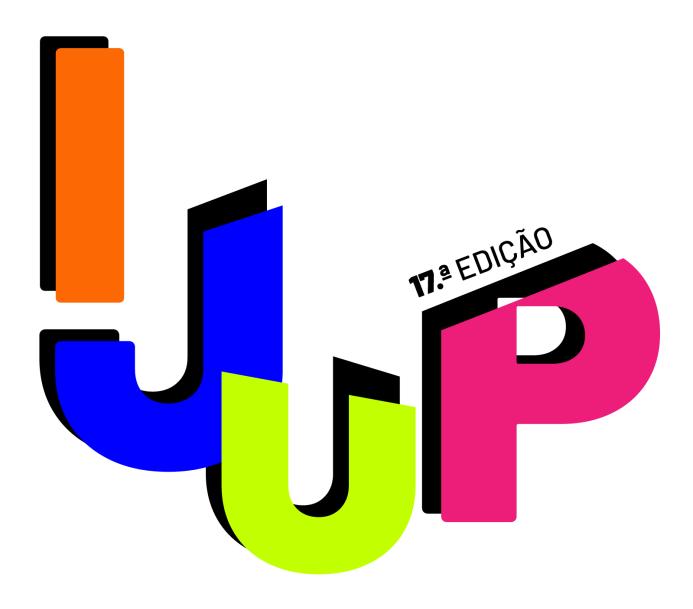
BOOK OF ABSTRACTS



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YOUNG RESEARCHERS MEETING







TÍTULO | *TITLE*

Livro de Resumos do 17.º Encontro de Investigação Jovem da U.Porto / *Book of Abstracts Young Researchers Meeting of U.Porto*

Universidade do Porto

Vice-Reitor para a investigação e Inovação

Professor Doutor Pedro Rodrigues

ijup@reit.up.pt

ISBN

Design

Serviço de Comunicação e Imagem da U.Porto

21769 | Microbiological Challenges of Insect-derived Food Products

<u>Cristiana Granja¹</u>; Ana C. Gomes¹; Ana M. Silva¹; M. João Novais¹; M. Margarida Guapo¹;

Patrícia Antunes^{1,2,3}

Faculty of Nutrition and Food Sciences, Porto University, Porto, Portugal¹; UCIBIO-Applied Molecular Biosciences Unit, Laboratory of Microbiology, Department of Biological Sciences, Faculty of Pharmacy, University of Porto. Porto, Portugal²; Associate Laboratory i4HB - Institute for Health and Bioeconomy.

Faculty of Pharmacy. University of Porto. Porto, Portugal³

Background & Aim: Insect-derived food products have been proposed as a potential solution to address demographic growth in western countries. Insects are regarded as a nutritious and markedly more sustainable food source compared to traditional animal protein sources (1). Recently, the European Commission approved four insect species for use as food ingredients in the EU market, sparking increased interest in their production for insect-based products. However, there are still barriers to overcome, particularly concerning the potential microbiological hazards they may pose (2). The goal of this study was to assess the literature, identifying production stages that may raise concerns and examining the associated microbiological risks. Methods: A search was conducted in the databases PUBMED and Google Scholar (up to May 2023), as well as in major food authorities (EFSA and FAO), using the keywords "edible insects" and "microbiology". The inclusion criteria comprised safety reports, reviews, and systematic reviews, that aligned with our research goals. Results: Microbial contamination and/or growth may occur at any stage of insect production. Several major poor practices and microbial hazards were identified in each stage: i) Insect creation, inadequate bio-safety conditions, with spore-forming bacteria (e.g., Bacillus cereus, Clostridium perfringens), and nontyphoid Salmonella; ii) Insect slaughter, contact between insects and excrement (e.g., pathogenic Escherichia coli); iii) Processing phase, contamination by food handlers (e.g., Staphylococcus aureus); iv) Transport: Refrigeration failure, with spore-forming bacteria (e.g., Bacillus cereus, Clostridium perfringens) (2,3) Conclusions: While every stage in insect production is critical, the analysis of literature on production stages and microbiological risks reveals that, with adequate control and prevention measures throughout the entire production chain, insects can indeed emerge as a safe and sustainable protein alternative in our diet.

Keywords: Edible Insects, Microbiology, Microbiological Hazards, Food Chain.

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