Instituto Nacional de Saúde Doutor Ricardo Jorge
Lisbon, Portugal | 17th November 2022

ICFNH 2022

1st International Congress on Food, Nutrition & Public Health

Towards a sustainable future

Book of Abstracts

FCT Fundação para a Ciência e a Tecnologia
REPÚBLICA PORTUGUESA SAÚDE
SNS SERVIÇO NACIONAL DE SAÚDE
Instituto Nacional de Saúde Doutor Ricardo Jorge
Food4DiAB

1st International Congress on Food, Nutrition & Public Health

Towards a sustainable future

Title

Book of abstracts of the 1st International Congress on Food, Nutrition & Public Health – Towards a Sustainable Future (ICFNH 2022)

Editors

Tânia Gonçalves Albuquerque, Helena Soares Costa, Mafalda Alexandra Silva

Edition

Instituto Nacional de Saúde Doutor Ricardo Jorge

Av. Padre Cruz

1649-016 Lisboa, Portugal

Date

November 2022

The editors state that the content of scientific abstracts is of the responsibility of their respectives authors.

Egyptian pumpkin by-product extracts as natural food preservatives

Leichtweis, M.G. (1,2); Molina, A.K. (1,2); Pereira, C. (1,2); Pires, T.C.S. (1,2); Calhelha, R.C. (1,2); Mohamed, M.H. (3); Oliveira, M.B.P.P. (4); Ferreira, I.C.F.R. (1,2); Barros, L. (1,2)

(1) Centro de Investigação de Montanha (CIMO), Instituto Politécnico de Bragança, Portugal; (2) Laboratório Associado para a Sustentabilidade e Tecnologia em Regiões de Montanha (SusTEC), Instituto Politécnico de Bragança, Portugal; *carlap@ipb.pt; (3) Horticulture Department, Faculty of Agriculture, Benha University, Egypt; (4) REQUIMTE - Science Chemical Department, Faculty of Pharmacy, University of Porto – Portugal

✉ mariagabriela@ipb.pt

The correlation between synthetic food additives and their adverse health effects has aroused the concern of consumers, which increasingly prefer natural food alternatives. On the other hand, industries have faced the challenge of meeting consumers' expectations with ready-to-use healthy products with a long shelf life. The present work aimed to investigate the by-products of pumpkin industrial processing as cheap sources of preservative compounds for food application. For that purpose, the seeds, peels, and fibers of five pumpkin genotypes cultivated in Egypt, namely 'Butternut Squash', 'Golden Cushaw', 'Dickinson', 'Halloween', and 'Honey Delite', were evaluated regarding their preservative potential. The hydroethanolic extracts of these by-products were assessed for their antioxidant activity, by TBARS in porcine brain homogenates, antimicrobial activity, against eight bacterial and two fungal strains with relevance in food contamination, and cytotoxicity in a primary culture of non-tumor hepatic cells (PLP2).

Regarding the antioxidant activity, it was tested using a cell-based assay that has the advantage of evaluating oxidizable biological targets. In general, all the samples presented great capacity of lipid peroxidation inhibition. The seeds showed the best results in four of the five evaluated genotypes, with IC50 values ranging from three to almost thirteen times higher than the positive control Trolox. In addition, all samples were able to protect against at least one of the eight tested bacterial strains. The seeds of 'Honew Delite' stood out, inhibiting six bacteria and the two tested fungi, followed by the peel of 'Butternut Squash', which inhibited five bacterial and two fungal strains. Actually, all the peel samples protected against at least three bacteria and one fungus. Furthermore, none of the tested samples showed cytotoxic activity against the non-tumor porcine liver cells up to the maximum tested concentration of 400 µg/mL, which is a first validation of their safe application in food.

Through these results, it is possible to point out the potential of pumpkin by-products as sources of preservative compounds, contributing to the gradual reduction of synthetic additives in food. On the other hand, it also promotes more sustainable industrial processes, by reusing pumpkin by-products.

Acknowledgments

Foundation for Science and Technology (FCT, Portugal) for financial support through national funds FCT/MCTES (PIDDAC) to CIMO (UIDB/00690/2020 and UIDP/00690/2020), SusTEC (LA/P/0007/2020), and UIDB/50006/2020 project; national funding by FCT, P.I., through the institutional scientific employment program-contract with C. P., R.C.C., and L.B. and A.K.M. and M.G.L. PhD grants (2020.06231.BD and 2020.06706.BD, respectively). To Project PRIMA Section 2 - Multi-topic 2019: PulpIng (PRIMA/0007/2019).