



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} Calhella 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;
³ Horticulture Department, Faculty of Agriculture, Benha University, Egypt;
⁴ REQUIMTE - Science Chemical Department, Faculty of Pharmacy, University of Porto – Portugal.
*carlap@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.

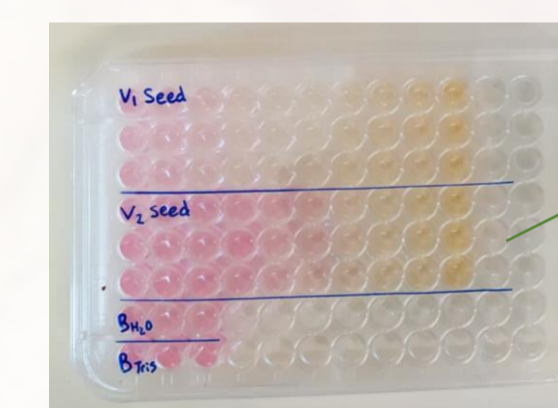
The present work aimed to investigate the by-products (seeds, peel, and fibers) of pumpkin industrial processing as cheap sources of preservative compounds for food application.



ANTIOXIDANT CAPACITY

TBARS assay

Lipid peroxidation inhibition capacity



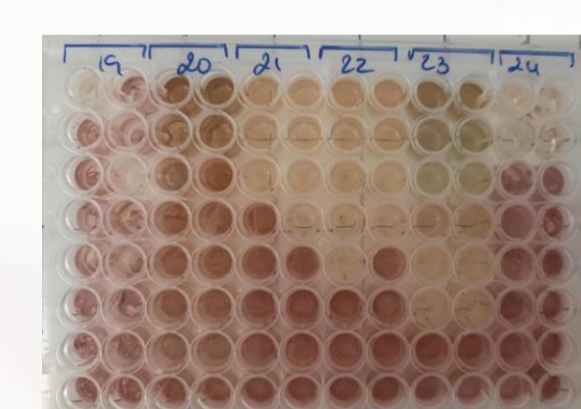
ALL SAMPLES
PRESENTED GREAT
CAPACITY

The seeds showed the best results in four of the five evaluated genotype

ANTIMICROBIAL
ACTIVITY

Antimicrobial activity

against eight bacterial and two fungal strains



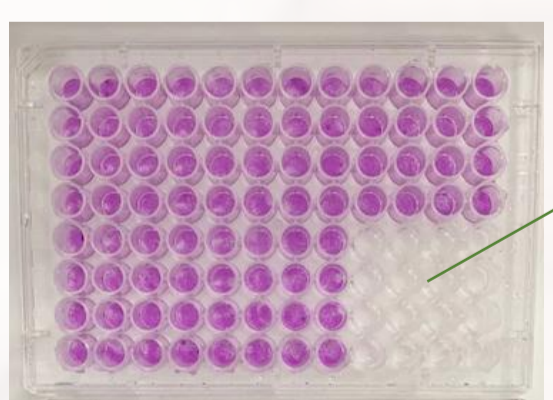
ALL SAMPLES
PRESENTED BACTERIAL
INHIBITION CAPACITY

The 'Honey Delite' seeds inhibited 6 bacterial and 2 fungal strains and the 'Butternut Squash' peel inhibited 5 bacterial and 2 fungal strains

CYTOTOXICITY

Hepatotoxicity

Cytotoxicity in a primary culture of non-tumor hepatic cells (PLP2)



NONE OF THE TESTED SAMPLES
SHOWED CYTOTOXIC ACTIVITY UP TO
400 µg/mL

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: The authors are grateful to the 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 FCT, P.I., within the scope of the Project PRIMA Section 2 - Multi-topic 2019: PulpIng (PRIMA/0007/2019).