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ANTIBACTERIAL AND ANTIOXIDANT POTENTIAL OF AQUEOUS EXTRACTS OF BIO-RESIDUES FROM AGROCYBE CYLINDRACEA AND PLEUROTUS OSTREATUS MYCELIUM

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The production of fresh mushrooms results in a large quantity of bio-residues, which may account for more than 20% of a crop volume and contributes to production costs and environmental impact, if not used. These products consist mainly of stalks, mushrooms of irregular dimensions and shape and basal material. Thus, the main objective of MicoBioExtract project is the valorisation of these bio-residues and the development of add-value by-products with bioactive compounds such as polysaccharides and phenolic compounds produced by mushrooms. In the present work, the aqueous extracts from *Agrocybe cylindracea* byproducts (ACB) and *Pleurotus ostreatus* mycelium (POM) were evaluated for potential antioxidant and antimicrobial activities.

Water soluble substances were extracted from mushrooms according to two different methods. In method 1 it was performed a hot extraction (extract 1A; 90 °C; 1 h; 500 rpms). In method 2, the biomass was submitted to an extraction at room temperature (extract 2B) and the resulting residue was extracted with hot water (extract 2C; 90 °C; 1 h; 500 rpms). The aqueous extracts from POM were obtained only by method 1. Extracts were lyophilized and their bioactivity evaluated measuring the antioxidant (ABTS, DPPH and ORAC) and antimicrobial (determination of the minimum inhibitory concentration – MIC) activities. The mutagenicity was also tested (Ames assay with and without S9). Moreover, it was determined the total phenolics content of the extracts and α and β – glucans (Folin Ciocalteu and Beta-Glucan Assay methods, respectively).

The results obtained from antioxidant methods showed that all extracts from both mushrooms are a potential source of natural antioxidant and phenolic compounds. According to ABTS, extract 2B from ACB showed the best value with 8.48 ± 0.33 mg ascorbic acid equivalent (AAE)/g dry extract and 4.14 ± 0.52 mg AAE/g dry extract for POM. Regarding the antimicrobial activity, MIC results showed that ACB and POM extracts inhibited the growth of Gram- (*Salmonella enteritidis*) and Gram+ (*Bacillus cereus* and *Listeria monocytogenes*). Concerning the mutagenicity, the results showed no toxic effect except for extract 1A from ACB. Regarding the β -glucan content, the extracts from ACB presented higher content of β -glucan than the C extracts from POM.

Thus, aqueous extracts from mushroom bio-residues showed potential antioxidant and antimicrobial properties and to develop a circular bioeconomy approach.