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Effects of gamma irradiation in the antimicrobial activity of wild mushroom extracts

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The interest of mushrooms has been increasing over time due to their potential in prevention or treatment of different diseases. Mushrooms have been reported for their anticancer, anti-inflammatory, and immunosuppressive and antimicrobial properties. In particular, several authors reported the antibacterial activity of extracts prepared from different mushroom species [1]. In spite of these undeniable qualities, mushrooms are one of the most perishable products and tend to lose quality immediately after harvest. Irradiation is recognized as a safe and effective preservation method, being used worldwide to increase the shelf life of foods (e.g. fruits and vegetables, spices, grains, meat or seafood, aromatic and medicinal plants and spices) [2, 3]. In the present study, the antibacterial properties of methanolic extracts prepared from *Boletus edulis* Bull. and *Hydnum repandum* L. Fr., previously submitted to gamma irradiation, were assessed against clinical isolates with different resistance profiles (two Gram negative bacteria: *Escherichia coli* and *Proteus mirabilis*, isolated from urine, and two Gram positive bacteria: MSSA- methicillin-sensitive *Staphylococcus aureus*, isolated from wound exudate and MRSA- methicillin-resistant *Staphylococcus aureus*, isolated from expectoration) from hospitalized patients in Local Health Unit of Mirandela, Northeast of Portugal. The fruiting bodies were collected in Trás-os-Montes (Northeast of Portugal) in November 2012. Gamma irradiation was performed in experimental equipment with four ⁶⁰Co sources at 1 and 2 kGy doses.

The 1 kGy dose does not seem to be the preferable choice to treat *B. edulis* and *H. repandum* (which have a better response to the 2 kGy dose). Among the tested extracts, those obtained from *B. edulis* presented the highest activity against all the tested bacterial. The antimicrobial activity of the mushroom extracts did not suffer significant changes that might compromise applying irradiation as a possible mushroom conservation technology. As a general conclusion, the 2 kGy should be considered as the best choice in terms of antimicrobial activity maintenance.

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