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GAMMA RADIATION PRESERVES CHEMICAL AND BIOACTIVE PROPERTIES OF BOLETUS EDULIS WILD MUSHROOMS

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Boletus edulis Bull: Fr. is an edible mushroom quite appreciated for its organoleptic and nutritional properties. However, the seasonality and perishability cause some difficulties in its distribution and marketing in fresh form; losses associated with this type of food during marketing can reach 40% [1]. Irradiation is recognized as a safe and effective method for food preservation, being used worldwide to increase shelf life of fresh and dehydrated products (e.g. fruits, vegetables and spices) [2]. In particular, gamma irradiation has already been applied to cultivated mushrooms (especially *Agaricus*, *Lentinula* and *Pleurotus* Genus) and proved to be an interesting conservation technology [3]. However, the studies with added-value wild species are scarce. In this work, the effects of gamma irradiation on chemical and antioxidant properties of wild *B. edulis*, were evaluated. Fruiting bodies were obtained in Trás-os-Montes, in the Northeast of Portugal, in November 2012. The irradiation was performed in experimental equipment with ⁶⁰Co sources at 1 and 2 kGy. All the results were compared with non-irradiated samples (control). Macronutrients and energy value were determined following official procedures of food analysis; fatty acids were analyzed by gas-chromatography coupled to flame ionization detection (GC-FID), while sugars and tocopherols were determined by high performance liquid chromatography (HPLC) coupled to refraction index (RI) and fluorescence detectors, respectively. Antioxidant activity was evaluated in the methanolic extracts by in vitro assays measuring DPPH (1,1-diphenyl-2-picrylhydrazyl) radical scavenging activity, reducing power, inhibition of β-carotene bleaching and inhibition of lipid peroxidation using thiobarbituric acid reactive substances (TBARS) assay. Total phenolics were also determined by the Folin-Ciocalteu assay. The nutritional profiles were not affected in high extension. Fatty acids and sugars were slightly affected, decreasing with the increasing doses. The performed assays for antioxidant activity, indicate that irradiated samples tended to have lower scavenging activity and reducing power, but higher lipid peroxidation inhibition. Despite the detected differences in individual compounds, the results of nutritional parameters, the most relevant in terms of mushroom acceptability by consumers, were less affected, indicating an interesting potential of gamma-irradiation to be used as an effective conservation technology for the studied mushrooms.

Key words: *Boletus edulis*, Chemical composition, Antioxidant activity; Gamma irradiation.

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