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Effects of gamma irradiation on physico-chemical parameters of chestnut fruits

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Food irradiation is a versatile process that can be applied to different food products to increase shelf life, for disinfestation or sterilization, being an alternative processing food technology to meet food safety quality parameters.

Chestnut (*Castanea sativa* Mill.) is an important food resource in several countries that it is post-harvest tretated, mainly for disinfestation, till recently with chemical fumigants, that it is dangerous for the operators and for the environment. Gamma irradiation could be a promising alternative, since this is a processing technology already validated for different food products. The typical disinfestation irradiation dose for fruits is 1 kGy or lower. In our study the effects of storage time and irradiation dose up to 3 kGy on physico-chemical parameters were evaluated. Those parameters included colour, texture, moisture, nutritional value, sugars, fatty acids and tocopherols. Interactions among irradiation dose (ID) and storage time (ST) were accessed using linear discriminate analysis (LDA). The nutritional composition was evaluated through determination of proteins, fat, ash, carbohydrates and energetic value. The chemical composition was focused in the main nutrients found in chestnuts: sugars – sucrose, fatty acids – palmitic, oleic, linoleic and linolenic acids, tocopherols – γ-tocopherol. The obtained results seem to indicate that the irradiation treatment, up to 3 kGy, did not affect the nutritional and chemical quality of chestnut fruits. Otherwise, storage time exerted more evident influence in those parameters.

For physical parameters, were considered the influence of gamma irradiation in two important characteristics for the consumer, the colour and texture. For the applied doses, up to 3 kGy, we did not observe any significant differences in colour between irradiated and non-irradiated chestnuts, after the processing and along time storage. For texture, only for the higher irradiation dose we observed a decrease in the value of the texture.

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