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Book of Abstracts of the 1st International Symposium on Profiling

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S14. Effects of gamma irradiation in *Castanea sativa* tocopherols profile: study extended to four different chestnut varieties

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Abstract

In the region of Trás-os-Montes, chestnut production represents a significant income, estimated to be about 15 M€ in 2010. It is therefore, mandatory to develop a safe, reliable and cheap disinfestation alternative to post-harvest fumigation with methyl bromide, since its eradication in 2010 by the European Union, due to environmental concerns and danger for the operators. Hot water dip is being used as a replacement, but still display considerable technical disadvantages, giving way to other alternatives like irradiation. Today, many food commodities (*e.g.* frog legs, spices, mushrooms) are irradiated in Europe with strict regulation and no health issues reported [1]. Tocopherols represent the isoforms of vitamin E, which are known for their excellent antioxidant activity, either alone or in synergy with vitamin C. The natural antioxidants present in fruits help the body fight against dangerous free radicals, which lead to oxidative stress, and their intake should be favoured over food supplements [2].

The effects of gamma irradiation on the nutritional [3] and antioxidant [4] profiles of chestnuts has been studied by our research group as well as other chemical and physical parameters. Radiation has very low impact in both physic and chemical parameters when compared to other treatments and to the storage time that chestnuts are subject to. In this study, the validation of gamma radiation at 1 kGy was extended to 4 different varieties of chestnuts, 3 from Portugal (*Longal*, *Judia*, and *Cota*) and 1 from Italy (*Palommina*). The tocopherols profile of each variety of chestnuts was determined through High Performance Liquid Chromatography coupled to a Fluorescence Detector, demonstrating a very high concentration of γ -tocopherol when compared to α and δ , and no trace β -tocopherol. At this dosage, gamma radiation preserved these bioactive compounds in all the varieties, confirming its benefits as a treatment for chestnuts.

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