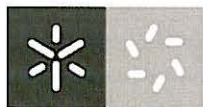
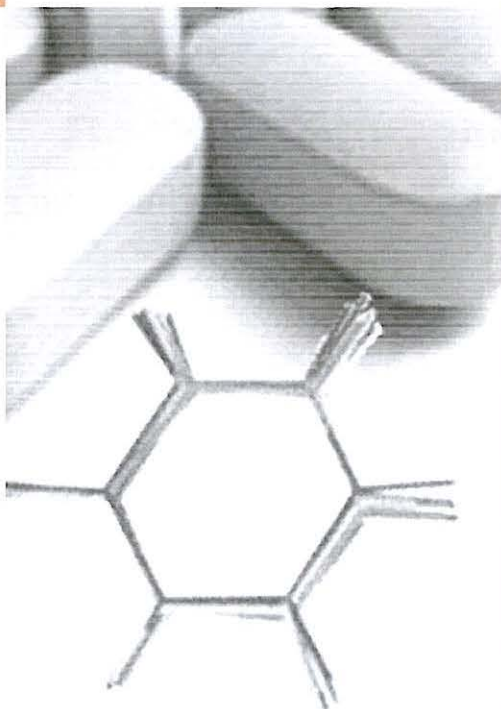


1st Symposium on MEDICINAL CHEMISTRY of University

Braga

Campus de Gualtar
17 May 2013



Universidade do Minho
Escola de Ciências



1911-2011
100 ANOS

Gamma irradiation combined with freezing of *Macrolepiota procera* preserves tocopherols, one of the most powerful natural antioxidants

Ângela Fernandes^{a,b}, Amílcar L. António^{a,c,d}, M. Beatriz P.P. Oliveira^b, Anabela Martins^a, Isabel C.F.R. Ferreira^{a,*}

^aCentro de Investigação da Montanha (CIMO), ESA, Instituto Politécnico de Bragança, Portugal

^bREQUIMTE/ Depto. de Ciências Químicas, Faculdade de Farmácia, Universidade do Porto, Portugal.

^cIST/ITN, Instituto Tecnológico e Nuclear, Portugal.

^dDepartamento de Física Fundamental, Universidad de Salamanca, Spain

*iferreira@ipb.pt

Vitamin E is the common name for a group of compounds which include tocopherols and tocotrienols. These compounds are lipophilic antioxidants with important effects in the body, including aging prevention, strengthening the immune system and reducing cancer risk [1]. Mushrooms are a source of antioxidants and in particular of tocopherols [2], powerful natural antioxidants. Nevertheless, they are perishable and tend to lose quality after harvesting, which is an impediment to their distribution and marketing in fresh. Therefore, several processing techniques have been applied to extend mushrooms shelf life. In the present work, freezing and oven-drying were selected and applied separately and combined with gamma irradiation to *Macrolepiota procera* wild samples, in order to evaluate the effects on the content and profile of tocopherols.

After collection (Bragança, Northeastern Portugal), fresh (kept at 4°C), frozen (kept at -20°C in a freezer) and dried (at 30 °C in an oven) fruiting bodies were submitted to gamma irradiation, performed in experimental equipment with four ⁶⁰Co sources, at 0.5 and 1 kGy. Tocopherols were determined by high performance liquid chromatography (HPLC) coupled to a fluorescence detector.

The combination of two different processing technologies tended to preserve the level of total tocopherols. If we focused in this vitamin, combining the freeze treatment with a 0.5 kGy dose would optimize the amount of total tocopherols in *M. procera* samples. Furthermore, frozen and dried samples presented the lower amounts of γ-tocopherol and δ-tocopherol, respectively. Individually, the gamma irradiation dose did not cause any noticeable change, either for individual vitamins or for total tocopherols.

Overall, gamma irradiation might act as a useful adjuvant to other conservation techniques such as freezing to preserve important antioxidant molecules.

Acknowledgments:

The authors acknowledge FCT and COMPETE/QREN/UE- strategic projects PEst-OE/AGR/UI0690/2011 (CIMO) and PEst-C/EQB/LA0006/2011 (REQUIMTE), and PhD grant to A. Fernandes (SFRH/BD/76019/2011).

References:

[1] C-Y. J. Lee, F. Wan. *J. Nutr.*, **2000**, *130*, 2932-2937.

[2] I.C.F.R. Ferreira, L. Barros, R.M.V. Abreu, *Curr. Med. Chem.*, **2009**, *16*, 1543-1560.