



2nd Symposium on **Medicinal Chemistry** of University of Minho

8 May 2015

SCHOOL OF SCIENCE, CHEMISTRY DEPARTMENT

Campus de Gualtar

Lipid Peroxidation Inhibition Capacity of Decoctions Prepared from Gamma Irradiated Medicinal Plants Traditionally Used in Portugal

J. Pinela^{ab}, A.L. Antonio^{ac}, A.M. Carvalho^a, M.B.P.P. Oliveira^b, I.C.F.R. Ferreira^a

^a Centro de Investigação de Montanha (CIMO), ESA, Instituto Politécnico de Bragança, Apartado 1172, 5301-855 Bragança, Portugal; iferreira@ipb.pt

^b REQUIMTE/LAQV, Faculdade de Farmácia, Universidade do Porto, Rua Jorge Viterbo Ferreira, n° 228, 4050-313 Porto, Portugal

^c Centro de Ciências e Tecnologias Nucleares - C²TN, Instituto Superior Técnico, Universidade de Lisboa, E.N. 10, 2695-066 Bobadela, Portugal

Due to the renewed interest and the growing use of medicinal plants, it is of great importance to study how their properties are affected by different post-harvest technologies to assure its quality and safety. Among the non-thermal physical technologies available to sanitize plant products, the irradiation treatment with gamma-rays emerges in an exceptional position. Meanwhile, there is a growing scientific interest in irradiation-induced modifications on the bioactive properties of treated products [1,2]. Therefore, two highly quoted medicinal plants traditionally used in Portugal were selected for this study. Both species, *Malva neglecta* Wallr. and *Tuberaria lignosa* (Sweet) Samp., are commonly prepared in decoctions for external and topical use due to its disinfectant and anti-inflammatory properties [3]; nevertheless, the effect of gamma irradiation on its bioactivity remained unknown until now. In this study, the effect of low-dose gamma irradiation on the lipid peroxidation inhibition capacity of these species was investigated. The plant material was sustainable wild harvested in the Northeast region of Portugal, lyophilised and then exposed to 1 kGy of γ -rays in a cobalt-60 chamber. Non-irradiated samples followed all the experiment. The lipid peroxidation inhibition capacity was evaluated in decoctions, prepared according to folk recipes/formulations from irradiated and non-irradiated samples, through the TBARS (thiobarbituric acid reactive substances) formation inhibition and β -carotene bleaching inhibition assays. *T. lignosa* decoctions revealed higher bioactivity than the *M. neglecta* ones. For *T. lignosa*, the TBARS formation inhibition capacity was maintained and the β -carotene bleaching inhibition capacity improved with the irradiation treatment, while *M. neglecta* revealed opposite results. This study confirms the suitability of low-dose gamma irradiation to maintain or improve the lipid peroxidation inhibition capacity of the treated plants. Even so, further studies are of interest to evaluate the effects on other quality parameters.

Acknowledgments:

The author acknowledges to PRODER research project n° 53514, AROMAP, for financial support of the work and to FCT (Portugal) for financial support to CIMO (PEst-OE/AGR/UI0690/2014), REQUIMTE (PEst-C/EQB/LA0006/2014), C²TN (RECI/AAG-TEC/0400/2012) and J. Pinela (SFRH/BD/92994/2013).

References:

- [1] J. Pinela *et al.*, *RSC Adv.*, 2015, 5, 14756.
- [2] E. Pereira *et al.*, *Food Res. Int.*, 2015, 67, 338.
- [3] A. M. Carvalho, *Biblioteca de Ciências* n° 35, 2010.