



# 3<sup>rd</sup> Symposium on Medicinal Chemistry of University of Minho

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School of Science, Chemistry Department

University of Minho, Campus of Gualtar

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## Improving the bioactivity of medicinal plants using gamma radiation: *Thymus vulgaris* L. infusions as a case-study.

Eliana Pereira<sup>a,b</sup>, Lillian Barros<sup>a</sup>, Amílcar L. António<sup>a</sup>, Sandra Cabo Verde<sup>b</sup>, Celestino Santos-Buelga<sup>c</sup>, M. Beatriz P.P. Oliveira<sup>d</sup>, Isabel C.F.R. Ferreira<sup>a</sup>

<sup>a</sup> Centro de Investigação de Montanha (CIMO), ESA, Instituto Politécnico de Bragança, Campus de Santa Apolónia, 5300-253 Bragança, Portugal;

<sup>b</sup> C2TN Centro de Ciências e Tecnologias Nucleares, IST, Universidade de Lisboa, Estrada Nacional 10 (km 139,7), 2695-066 Bobadela LRS, Portugal

<sup>c</sup> GIP-USAL, Faculdade de Farmácia, Universidade de Salamanca, Campus Miguel de Unamuno, 37007 Salamanca, Espanha

<sup>d</sup> REQUIMTE/LAQV, Science Chemical Department, Faculty of Pharmacy of University of Porto, Rua Jorge Viterbo Ferreira, 228, 4050-313 Porto, Portugal. [iferreira@ipb.pt](mailto:iferreira@ipb.pt)

The bioactive compounds present in medicinal plants have shown beneficial effects in the prevention of various diseases due to their capacity to act positively in several biological mechanisms [1] with reduced adverse effects [2].

The aim of this work was to evaluate the effects of gamma radiation processing, at doses of 1 and 10 kGy, on antioxidant activity and phenolic composition of a medicinal plant used in traditional medicine - *Thymus vulgaris* L., and the results compared with the control sample (0 kGy). After plants processing, an infusion was prepared, from irradiated and non-irradiated samples, to evaluate antioxidant properties through: free radicals scavenging activity, reducing power and inhibition of lipid peroxidation in brain cell homogenates (TBARS assay) methods. And phenolic compounds were analysed by HPLC-DAD-ESI/MS.

Comparing the results obtained for control (0 kGy) and irradiated samples (at 1 and 10 kGy), it was evident that gamma irradiation at the dose of 10 kGy improved free radical scavenging activity, reducing power and lipid peroxidation inhibition capacity of the infusions (lower values of EC<sub>50</sub>). Regarding phenolics, thirteen compounds were detected in the infusions prepared either from irradiated or non-irradiated samples. However, the global phenolic profile was not changed. In this way, gamma radiation could be considered as a suitable treatment to be used in dried plants, in particular, to improve bioactive properties of *Thymus vulgaris* L. related to its phenolic composition [3].

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### References:

- [1] S. Kumar, M. Yadav, A. Yadav, J.P. Yadav, *J. Afr. J. Bot.* **2017**, *111*, 50.
- [2] S. Wanga, P. Shena, J. Zhouc, Y. Lu, *Pharmacol. Res.* **2017**, *119*, 327.
- [3] E. Pereira, L. Barros, A.L. Antonio, S. Cabo Verde, C. Santos-Buelga, I.C.F.R. Ferreira. *LWT - Food Sci Technol.* **2016**, *74*, 34.