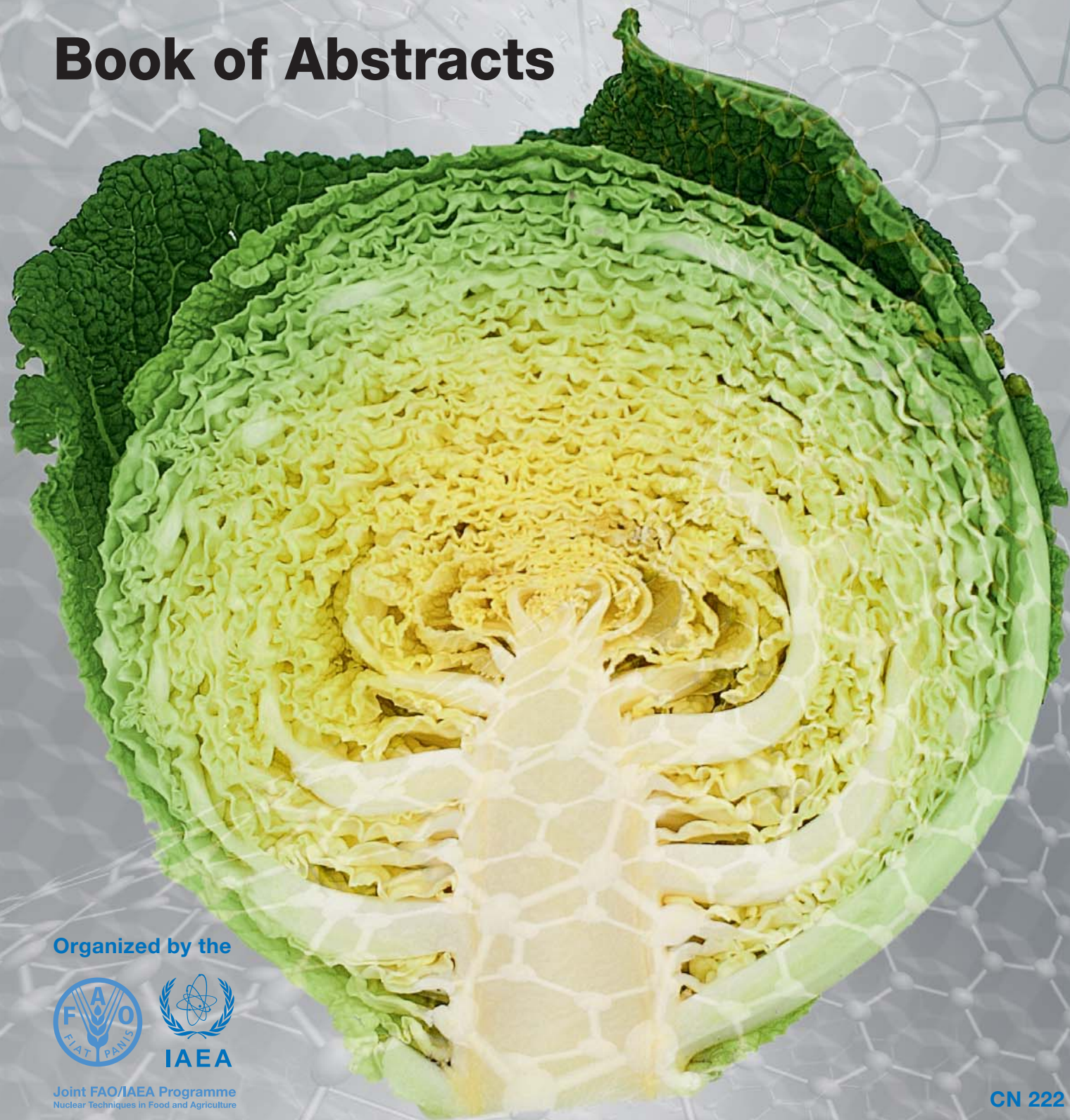


International Symposium on Food Safety and Quality: Applications of Nuclear and Related Techniques

10–13 November 2014, Vienna, Austria

Book of Abstracts



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Joint FAO/IAEA Programme
Nuclear Techniques in Food and Agriculture

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Dose-response effects of gamma irradiation on colour and antioxidant activity of wild *Malva neglecta*

PINELA, José^{1,2}; ANTONIO, Amílcar L.^{1,3}; BARROS, Lillian¹; CARVALHO, Ana M.¹; OLIVEIRA, M. Beatriz P. P.²; FERREIRA, Isabel C. F. R.¹

¹ Centro de Investigação de Montanha (CIMO), ESA, Instituto Politécnico de Bragança, Portugal

² REQUIMTE/Departamento de Ciências Químicas, Faculdade de Farmácia, Universidade do Porto, Portugal

³ Centro de Ciências e Tecnologias Nucleares, IST, Universidade de Lisboa, Portugal

Corresponding Author: jpinela@ipb.pt

Radiation processing technology has been used to improve food security, safety and quality. However there are a few reports in the literature on the effect of irradiation on bioactivity of herbs and medicinal plants [1]. Hence, the present work was undertaken to investigate the dose-response effects of gamma irradiation on the colour and antioxidant activity of wild *Malva neglecta* Wallr. In the north-eastern of Portugal, this annual herbaceous plant is traditionally eaten raw as leafy vegetable or prepared in herbal beverages due to its disinfectant and anti-inflammatory properties [2]. Dried *M. neglecta* samples were exposed to 0 (control), 1, 5 and 10 kGy of γ -rays in a ⁶⁰Co experimental chamber. After irradiation, the values of CIE L* (lightness), a* (redness) and b* (yellowness) were measured using a Minolta colorimeter; and the antioxidant activity determined in decoction preparations through the DPPH (2,2-diphenyl-1-picrylhydrazyl) free radicals scavenging activity assay, reducing power by the ferricyanide/prussian blue assay, and lipid peroxidation inhibition by β -carotene/linoleate and thiobarbituric acid reactive substances (TBARS) assays. The results suggest that the irradiation treatment with doses up to 10 kGy have no influence on trichromatic colour values L*, a* or b*. However, the effect on the antioxidant activity was somehow different. Samples irradiated with doses of 1 and 5 kGy exhibited higher antioxidant performances than the non-irradiated control in the ferricyanide/prussian blue and TBARS assays. Otherwise, irradiation dose of 10 kGy led to a decrease in antioxidant activity (showing higher EC50 values) in all in vitro assays. Overall, this study demonstrated that gamma irradiation at 10 kGy can adversely affect the antioxidant activity of *M. neglecta* decoctions, but has no effect on colour parameters.

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[1] N.S. Rajurkar et al., International Journal of Pharmacy and Pharmaceutical Sciences, 2012, 4, 93-96.

[2] A.M. Carvalho. Biblioteca de Ciências n° 35. 2010.