

**EFFECT OF GAMMA-IRRADIATION ON
MICROBIOLOGICAL, PHYSICOCHEMICAL AND
SENSORY CHARACTERISTICS OF CEYLON
CINNAMON (*Cinnamomum zeylanicum*)**

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by

**THOTAMUNA KANKANAMALAGE VIRAJANI VIJAYANTHI
CHANDRASEKARA**

**Department of Animal Science
Faculty of Animal Science and Export Agriculture
Uva Wellassa University**

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ABSTRACT

Ceylon cinnamon (*Cinnamomum zeylanicum*), commonly known as the "True cinnamon" has dominated the international spice market due to its high cinnamaldehyde content, strong aroma and rich flavor. Sri Lanka is the leading producer and exporter of Ceylon cinnamon. The initial microbial load in spices and herbs, in particular spore-forming bacteria, could be a serious threat for the hygienic safety of final processed products. Gamma-irradiation is a novel technique, and it is more effective than ethylene oxide fumigation for sanitation of spices in controlling microbial contamination without adverse effect. Therefore, the present study was carried out to evaluate the effects of different doses of gamma-irradiation on microbiological, physicochemical and sensory characteristics as total plate count (TPC), yeast and mold count (YMC), total flavonoid content, total phenolic content, reducing sugar content, antioxidant activity, pH, water activity, hunter values and sensory attributes of Ceylon cinnamon. Cinnamon samples were collected from the local market and subjected to five doses of irradiation as 1, 3, 5, 7 and 10 kGy using an industrial Co⁶⁰ gamma-irradiation source. Non-irradiated cinnamon sample was used as the control. There was a significant reduction (100%) in TPC and YMC with increasing the irradiation dose up to 10 kGy. The proximate composition of cinnamon treated with 10 kGy did not showed any significant differences in crude protein, crude fat, crude fiber, and ash content compared to control while moisture content was significantly lower than the control. Results of physiochemical properties (antioxidant activity and color values) and sensory attributes did not show significant difference in treatments and control samples. However, significantly lower levels of total flavonoid content, total phenolic content and reducing sugar content were observed in treatment with 10 kGy irradiation dose compared to control. In conclusion, the 10 kGy gamma-irradiation dose was not adversely affected on quality of Ceylon cinnamon.