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Evaluation of potential of gamma radiation as a conservation treatment for blackberry fruits

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Abstract.
BACKGROUND: Blackberries consumption has been associated with health benefits. However, these fruits present a short shelf-life. Thus, food irradiation is a potential alternative technology for conservation of these fruits without use of chemicals.
OBJECTIVE: Analyse the potentiality of gamma radiation as a decontamination method for blackberry fruits.
METHODS: Fresh packed blackberries were irradiated in a Co-60 source at two doses (1.0 and 1.5 kGy). Bioburden, physical and rheological, sensorial and total soluble content parameters were assessed before irradiation, immediately after and at two days storage time at 4°C.
RESULTS: The characterization of blackberries microbiota point out to an average bioburden value of 10^4 CFU/g and to a microbial population predominantly composed by filamentous fungi. The inactivation studies on the blackberries mesophilic population indicated a limited microbial inactivation (<1 log decimal reduction) for the applied radiation doses, being the surviving population mainly constituted by filamentous fungi and yeast. No effect of irradiation on colour of blackberries was observed. Concerning texture parameters, no significant differences were observed in both fracturability and firmness between non-irradiated and irradiated blackberries immediately after irradiation. In blackberries stored for two days, both parameters were slightly lower in irradiated blackberries, compared to non-irradiated blackberries. The performed sensorial analysis indicated a similar acceptability among irradiated and non-irradiated fruits.
CONCLUSION: This work reveals gamma irradiation treatment potential since no major impact was detected on blackberries physical, rheological and sensory attributes. Further studies with longer periods of storage are needed to elucidate the advantages of irradiation as a conservation treatment.

Keywords: Blackberries, food irradiation, food microbiology, rheological properties

1. Introduction

Vegetables and fruits provide most of the micronutrients of the human diet. They are also important sources of dietary fibre and phytochemicals. High consumption of fruits and vegetables has since long been associated with a lower risk of non-communicable chronic and inflammatory diseases, such as cardiovascular diseases, diabetes and

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