

# MICRO BIOTECH 15

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## *Salmonella typhimurium* inactivation in *Mentha x piperita* L. by gamma irradiation

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*Salmonella* is an important foodborne pathogen and one of the most significant causes of bacterial gastroenteritis around the world [1]. Its transmission occurs through the ingestion of contaminated fruits, vegetables or aromatic plants. Many studies have described a relation between *Salmonella* transmission and the consumption of aromatic herbs, like *Mentha x piperita* L. [2]. *Mentha piperita*, commonly known as peppermint, is largely consumed in infusions and other beverages, being also included as ingredient in many food products. In this scenario, the use of ionizing radiation appears as an important tool to guarantee microbiological safety of such products. Although it's effective application, most irradiation studies focuses on the effects of this technology on fresh products [2, 3].

The main goal of this work was to analyze the inactivation of *Salmonella typhimurium* in dry leaves of peppermint by gamma irradiation. The methodology was based on microbiological load determination of mint samples before and after irradiation at several doses of gamma radiation (0.5 kGy to 1.5 kGy), by conventional culture methods. The irradiation procedure was performed with a <sup>60</sup>Co source (dose rate of 1.2 kGy/h).

The estimated D<sub>10</sub> value (dose required to reduce the bacteria population by 90%) for *S. typhimurium* was 1.4 ± 0.1 kGy. In contrast with other studies that have shown a 5 log<sub>10</sub> CFU/ml reduction of this bacteria in fresh aromatic herbs [2], a reduction of only 1 log<sub>10</sub> CFU/ml (90% inactivation efficiency) was achieved for *S. typhimurium* inoculated on dried mint at a dose of 1.5 kGy. These results highlight the differences in microorganism's response to irradiation depending on abiotic factors, such as substrate

Irradiation is highly effective for inactivation of foodborne pathogens in various products, improve microbiological shelf life and extend sensory quality [4], but the dose required for each individual application should be established by risk analysis, taking into consideration the contamination level, the hazard involved, oxygen presence, the efficiency of the radiation treatment and storage conditions. Therefore, this work suggests the irradiation technology as an effective treatment and environmentally friendly, intending to validate their use in decontamination/microbial disinfection in dried plants with food and medicinal interest.

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