Introduction

The increase of consumption of natural products has become a public health problem. The concern in the safety of these products is due, in part, to the possible presence of pathogenic bacteria and fungi producing mycotoxins. Thus the evaluations of the hygienic quality of medicinal plants, as well as the use of decontamination methods are significant steps towards the consumer safety.

Aim

The aim of this study is to assess the effects of gamma irradiation on the microbial burden and antioxidant activity of medicinal plants, namely Melissa officinalis.

Materials and Methods

Samples of dried Melissa officinalis were irradiated in Co-60 experimental equipment.

After irradiation, samples of 1 g were homogenized on 100 ml of saline solution with a tensoactive agent in stomacher equipment during 15 minutes.

Bacterial and fungal counts were assayed before and after irradiation by membrane filtration method on TSA and MEA.

Regarding to antioxidant activity, FRAP assay was determined.

Water extract of M. officinalis (WEM) and ethanol extract of M. officinalis (EEM) were prepared.

Results and Discussion

- The M. officinalis microbiota showed a diverse microbial population predominantly composed by 1 morphological type: Gram positive catalase positive bacilli (67.9%).
- The inactivation studies of the M. officinalis mesophilic population indicated linear inactivation kinetics, with a one log reduction of microbial burden for the applied gamma radiation dose of 5 kGy.
- The apparent numerical decrease may be related to the types of microorganisms that constitute the M. officinalis microbiota. In this study, there is a lower inactivation for the fungal population, with a decrease of 0.5 log after irradiation at 5 kGy.
- Regarding to antioxidant activity, for WEM the antioxidant activity reveals an increase of about 28% at 3 kGy, while for EEM shows an increase of 78% at 5 kGy. This increases of antioxidant activity demonstrated that the radiation up to 3 kGy has influence on antioxidant activity of both extracts.

Conclusion

The obtained results suggested that the gamma irradiation treatment could be advantageous in improving microbial safety of M. officinalis with the potential added-benefit of increasing its antioxidant content.

References