



# Agricultural Journals

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# **Czech J. Food Sci.**

## **Sádecká J.: Influence of two**

# sterilisation ways, gamma-irradiation and heat treatment, on the volatiles of black pepper (*Piper nigrum* L.)

Czech J. Food Sci., 28 (2010): 44-52

The objective of this study was to investigate and compare the effects of ionising irradiation with different doses of gamma-rays (5 kGy, 10 kGy, and 30 kGy) versus the effect of heat sterilisation (dry steam, 130° C, 3 min) on the microbiological quality of powdered black pepper. Subsequently, the aim was to determine the impact of these sterilisation ways on the possible changes in the chemical composition and sensory quality (flavour) of black pepper essential oils. Methods of gas chromatography (GC/FID, GC/MS) were utilised for the evaluation of the essential oils compositions. The volatile constituents of black pepper extracts were studied with regard to their particular contribution to the overall aroma by the technique of gas

chromatography-olfactometry (GC/O) using the method of Aroma Extract Dilution Analysis [AEDA]. Qualitative compositions of volatile oils obtained from the control sample (0 kGy), samples irradiated at various doses, and heat treated sample were identical. The most significant changes were observed in the contents of volatile compounds after ionising radiation treatment with 30 kGy and heat treatment, respectively. These changes caused a remarkable decrease in the overall aroma of heat sterilised black pepper. Additionally, microbiological analysis showed that the heat treatment was insufficient for an effective reduction/elimination of the polluting microflora present in the analysed sample of black pepper.

**Keywords:**

food irradiation; spices; essential oils; GC; GC/MS; sensory quality; olfactometry

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