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PAVEENA LEELAPATTRANURUK : EFFECTS OF RADIATIONS ON
MICROBIAL CONTAMINATION, ACTIVITY AND CHEMICAL COMPOSITION
OF ANTIMICROBIAL HERBS. THESIS ADVISORS : MALYN CHULASIRI,
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The selected herbs which are known to have antimicrobial compounds i.e. garlic (*Allium sativum* Linn.) bulbs, pomegranate (*Punica granatum* Linn.) fruit rinds, roselle (*Hibiscus sabdariffa* Linn.) calyxes, and tea (*Camellia sinensis* Linn.) leaves were exposed to gamma and ultraviolet (UV) radiations. After being irradiated with 1, 3, and 5 kGy of ionizing radiation from a cobalt-60 source for 5, 15, and 15 minutes and with non-ionizing radiation from ultraviolet source for 30, 60, and 120 minutes, the irradiated herbs were examined for number of contaminants, and specified microorganisms i.e. *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Salmonella* spp., and *Clostridium* spp., as well as antimicrobial potency and components, and compared to unirradiated herbs. The results showed that unirradiated garlic was most heavily contaminated with bacteria and fungi. The specified microorganisms were not detected in either unirradiated or irradiated samples.

In comparison of radiated herbs, the reduction of microorganisms in UV treated herbs was less than that in gamma ray treated ones, especially at the treatment dose of 5 kGy. There was slight reduction of microbial number in UV treated herbs as compared to the untreated herbs. Gamma treatment at 5 kGy reduced the microbe contamination more than other doses and caused complete elimination in tea. The UV and gamma treatments had no effect on antimicrobial potency of herbs except for that of garlic. The preliminary chemical analysis to examine if there was any radiolytic components in these herbs by thin layer chromatography (TLC) revealed that no such compounds were detected in any tested herbs.

This study indicated that gamma irradiation treatment was one of the physical methods to decontaminate microbes in herbs.