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Radio Frequency Heating for Biological Decontamination in Kariyat Herb (*Andrographis paniculata* (Burm.f.) Wall.ex Nees)

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Abstract

Kariyat (*Andrographis paniculata* (Burm.f.) Wall.ex Nees) is a herbaceous plant which is used in traditional medicine. The main active ingredients of this plant are andropraphol ides and dehydroandropraphol ide. The aim of this study was to investigate the efficiency of radio frequency RF treatment in controlling biological contaminates such as total bacterial count, total yeast and mold, enterobacteria; (*Eshericia coli*, *Salmonella* spp., *Staphylococcus aureus*, *Clostridium* spp.) and its effect on andropraphol ides and dehydroandropraphol ide contents. Milled herb with initial moisture content (mc) of 5 % was conditioned to 20 % mc. Then, the herb samples were exposed to RF at an operating frequency of 27.12 MHz with temperatures of 80, 85, 90 and 95°C for 3 and 5 minutes of application time. The percentage of biological contamination was detected by the use of the Potato Dextrose Agar (PDA) and blotter methods. After that the amount of andropraphol ide(hRf) and dehydroandropraphol ide were determined by ethanol extract methods. The result showed that total bacteria count from RF 90°C 5 min reduced from 3.5×10^5 CFU g^{-1} to 6.8×10^4 CFU g^{-1} lower than acceptance criteria (2×10^5 CFU g^{-1}), total yeast and mold from every treatment treatments were 1.5×10^4 CFU g^{-1} which less than acceptance criteria (2×10^4 CFU g^{-1}). The enterobacteria number was 8×10^2 CFU g^{-1} which lower than acceptance criteria (1×10^3 CFU g^{-1}). *Escherica coli*, *Salmonella* spp., *Staphylococcus aureus*, *Clostridium* spp. were not detected in most RF treatments. The amount of active ingredients as andropraphol ide was detected from 62 - 65 hRf which were treated with RF from 80 and 85°C and it was not detected from 90 and 95°C treatments, and dehydroandropraphol ide was not detected from RF-treatment temperatures of 80 - 85°C, but the RF treatment 90 and 95°C they were found at the number of 65 hRf. The experiment has shown that RF treatment at 90°C for 5 minute showed the best performance in biological decontamination with remaining their active ingredient. A high temperature (90°C) resulted to andropraphol ide to dehydroandropraphol ide by dehydration process.

Keywords: Andropraphol ide, decontamination, dehydroandropraphol ide, Kariyat herb, radio frequency (RF) technique

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