ABSTRACT

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ANTIMICROBIAL ACTIVITY OF KAFFIR LIME (*Citrus hystrix* DC.) LEAVES EXTRACT AGAINST FOOD PATHOGENIC MICROORGANISMS
(xiv + 136 pages : 7 tables, 12 pictures, 16 appendixes)

Kaffir lime leaves are commonly used as cooking ingredients. In addition, they can also be used as medicinal herbs and have been proven as an antioxidant and have antimicrobial properties. In this study, the antimicrobial activity of the kaffir lime leaves extract against Bacillus cereus, Staphylococcus aureus, Escherichia coli, Salmonella Typhi, and Aspergillus flavus was tested using well diffusion method. The leaves extract was obtained by maceration method with ethanol, ethyl acetate, and hexane. The data showed that selected extract was ethanol 10%, where the inhibition zone against Bacillus cereus and Staphylococcus aureus were 6.10 mm and 6.43 mm, respectively. At this concentration, there was no inhibition activity towards Escherichia coli, Salmonella Typhi, and Aspergillus flavus. This study also showed that the antimicrobial activity of the extract increased at low pH and high salt concentration. The activity of the extract is independent to the heating temperature. However, the increase in heating time resulted in the decrease of the antimicrobial activity. The antibiotic comparison testing showed that 100 ppm of penicillin G was 2 times more effective than the extract, whereas 100 ppm of streptomycin was 1.5 times more effective than the extract. The AAS detected the leakage of Ca²⁺ and K⁺ on the bacterial cells when the extract was added. The observation by SEM showed that the addition of the extract resulted in the morphological damage of the cells. The toxicity testing by BS LT concluded that the extract had a low level of toxicity (LC₅₀ = 219.28 ppm). According to the result of the GC-MS, there were 47 compounds in the extract of the kaffir lime leaves, five of them that had antimicrobial activity were palmitic acid, linoleic acid, phytol, β-citral, and citronellal.

Keywords : kaffir lime leaves, maceration, extract, antimicrobial, pathogenic microorganisms