Antibacterial Activity of Water lily Seed Extract Toward Diarrhea-causing Pathogenic Bacteria

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Abstract

The objectives of this study was to observe antibacterial activities of water lily seed, against diarrhea-causing pathogenic bacteria as well as lactic acid bacteria; phytochemistry components in water lily seed and to evaluate each component's activities against pathogen bacteria. Extraction of antibacterial components in the seed was done by fractional extraction methods using solvent based on its polar level, i.e. hexane, ethyl acetate and ethanol. The activities of each extract was tested by using diarrhea-causing bacteria, Enteropathogenic Escherichia coli K.1.1 (EPEC K1.1) and S. typhimurium with agar well diffusion method. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) values were calculated with plate counting. Qualitative phytochemical tests were performed on all extracts. Fractionation was performed on extract with the largest antimicrobial activity by using thin-layer chromatography. The activities of each fraction were tested qualitatively by bio-autography method on thin layer chromatographic plates. The water lily seed had an antibacterial activity against EPEC K.1.1 and Salmonella typhimurium, especially in ethyl acetate extract. Ethanol extract had the same, yet lower activity. Ethyl acetate and ethanol extract of the seed did not show inhibition against the growth of lactic acid bacteria (Lactobacillus sp) and Bifidobacterium bifidum. The MIC and MBC values of the ethyl acetate extract on EPEC K1.1 were 0.89 (mg/mL) and 1.33 (mg/mL), respectively, while similar values of that on S. Typhimurium were 1.11 (mg/mL) and 1.33 (mg/mL¬), respectively. Phytochemistry components within ethyl acetate extract were alkaloids, flavonoids, tannins, glycosides, saponins, and triterpenoids. All fractions in the ethyl acetate extract had antimicrobial activities against EPEC K.1.1 and S. Typhimurium. These fractions were thought to inhibit the growth of the test-microbes by synergic action of each component.

Key words: *water lily seed, antibacterial, ethyl acetate extract*