ABSTRACT

# ANTIBACTERIAL ACTIVITY OF CINNAMON BARK ESSENTIAL OIL NANOEMULSION AS POULTRY FEED ADDITIVE CANDIDATE

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Antimicrobial agents such as antibiotics are commonly used in poultry production for prevention and treatment of diseases. The use of antibiotics raises the risks concerning the development of antibiotics resistant and increasing interest of research for alternatives to replace antibiotics. Essential oils (EO) have been studied for their antimicrobial abilities, including cinnamon (*Cinnamomum burmannii*) bark essential oil (CBO). This study was conducted to investigate the antimicrobial activity of CBO nanoemulsion against *Salmonella* *typhimurium*. The CBO was quantitatively analyzed using Gas Chromatography (GC). The formulations which consisted of CBO, virgin coconut oil (VCO), surfactant (Tween 80), and co-surfactant (PEG 400) were investigated to prepare emulsion in nano-meter size. The nanoemulsion was developed using low energy emulsification method. The macrodilution method was used to investigate the antimicrobial activity against *S.* *typhimurium* in Muller Hinton Broth (MHB) medium. The stable nanoemulsion having mean droplet diameters of 20.2 nm with polydispersity index (PI) 0.463. The nanoemulsion morphology was reveals the oil droplets in nano-scale and spherical oil globules using transmission electron microscopy (TEM). The antibacterial against *S. typhimurium* was observed upon treatments with distilled water, Penicillin G at MIC dosage (8 mg/L), CBO (12.5%) + ethanol and nanoemulsion. The significant reduction in bacterial growth was observed. The values of antibacterial activities were 85.35% ± 1.12; 64.81% ± 1.09; 0.00% ± 0.32 and -1.07% ± 0.37 for CBO + ethanol, nanoemulsion, distilled water and Penicillin G respectively. This study showed that CBO nanoemulsion may be for poultry feed additive as antimicrobial agent.