

Antibacterial Activity and Chemical Composition of *Aquilaria malaccensis* and *Aquilaria sinensis* Essential Oils

Nurliyana Izzati Yusri, Zaidah Zainal Ariffin

Structured Abstract

Background: Previous studies of antibacterial activity and chemical composition of *Aquilaria malaccensis* and *Aquilaria sinensis* essential oil were very limited number against Gram-negative and Gram-positive bacteria wound infections which are *Staphylococcus aureus*, Methicillin-resistant *Staphylococcus aureus*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa*. *Aquilaria* spp produce resinous portion, known as agarwood, that can be processed into essential oil and have been used in various sectors. For example, perfume industries, in religious ceremony, and medicine. Disk diffusion method done to observe the antibacterial activity by observing the formation of inhibition zone. Gas chromatography-mass spectrometry analysis used to identify the chemical composition that can interfere with and contribute antibacterial activity of *A. malaccensis* and *A. sinensis*. The purpose of the research is to determine the antibacterial activity against wound infection bacteria and identify the chemical composition of *A. malaccensis* and *A. sinensis* essential oils.

Methods: Antibacterial activity was done by disk diffusion method using 1 mg/mL, 5 mg/mL, and 10 mg/mL. The mean diameter of the expressed zone inhibition present by clear visible surroundings was measured to the nearest centimetre (cm). Gas chromatography-mass spectrometry (GC-MS) analysis was used to determine the chemical composition of selected essential oils by separating chemical mixtures and identify the chemical composition at a molecular level.

Results: The disk diffusion method only shows zone inhibition only at 10 mg/mL concentration of both essential oils. No further test of Minimum inhibitory concentration (MIC) was conducted for antibacterial study. There are 34 different chemical composition of *A. malaccensis* essential oil, with major components of α -Cadinol, δ -Cadinene and γ -Eudesmol. There are 25 different chemical compound of *A. sinensis* essential oil. The main chemical composition are Valerianol, γ -Eudesmol and 10-epi- γ -Eudesmol. The most dominant compounds is Sesquiterpenoids.

The study shows *A. malaccensis* and *A. sinensis* essential oils are not antibacterial agents against wound bacterial infection because they unable to produce zone inhibition at 1 mg/mL. This research also success to determine chemical composition of the essential oils using GC-MS.

Keywords: *Aquilaria malaccensis*, *Aquilaria sinensis*, antibacterial activity, chemical composition

*Correspondence: 2021852942@student.uitm.edu.my

Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia