

Inhibition of *Pseudomonas aeruginosa* quorum sensing by *Curcuma xanthorrhiza* roxb. extract

ABSTRACT

Microorganisms such as *Pseudomonas aeruginosa* have always been adaptable in surviving the harsh environment such as antimicrobial agents via the quorum sensing (QS) mechanism. Studies have shown that quorum sensing mechanism cases have been highly associated with foodborne illnesses. Since synthetic compounds such as azithromycin (AZM) are reported to have detrimental effects on human, using medicinal local plants have been gaining attention as an anti-quorum agent. The aim of this study was to determine the anti-quorum sensing activity of the *Curcuma xanthorrhiza* Roxb. extract against *P. aeruginosa* ATCC35554 quorum sensing system including swarming motility, pyocyanin production and biofilm formation. The results indicated that the extract required a high concentration to inhibit and kill the *P. aeruginosa* with minimum inhibition concentration (MIC) and minimum bactericidal concentration (MBC) values of 200 and >700 mg/mL, respectively. Thus, anti-quorum sensing assays were done in concentration up to 200 mg/mL. The inhibition of quorum sensing activity of *C. xanthorrhiza* Roxb. extract on *P. aeruginosa* quorum sensing was concentration dependent manner. At 200 mg/mL of the extract exhibited 72.12% reduction of swarming motility, 84.30% inhibition of the pyocyanin production and 78.35% reduction in the biofilm formation. In conclusion the crude extract of *C. xanthorrhiza* Roxb. extract has ability to reduce the virulence factors; swarming motility, pyocyanin production and biofilm formation regulated by quorum sensing. Thus, the extract *C. xanthorrhiza* Roxb. extract has anti-quorum sensing or quorum quenching activity.

Keyword: Anti-quorum sensing; *Curcuma xanthorrhiza* Roxb.; *Pseudomonas aeruginosa*; Swarming motility; Pyocyanin production; Biofilm formation