Abstract

Clostridium difficile infection (CDI) is a healthcare-associated gastrointestinal infection caused by *Clostridium difficile* (*C. difficile*), an anaerobic spore-forming gram-positive bacterium. The primary treatment for CDI is using antibiotics such as metronidazole and vancomycin. However, both drugs are reported to be less effective against *C. difficile* due to resistance. Several natural products such as asiatic acid (AA) and its derivatives have shown promising antimicrobial properties against *C. difficile.* In this study, the antimicrobial activity of AA and its derivatives such as AT1, LS1, and LS2 were investigated against *C. difficile* 630 and R20291 using the minimal inhibitory concentration (MIC) and time-kill kinetic assay. AA showed an inhibitory effect against *C. difficile* 630 and R20291 with MIC value 20 µg/ml. Meanwhile, LS1 showed an inhibitory effect against *C. difficile* 630 and R2091 with MIC values of 10 and 10-15 µg/ml, respectively. Similarly, LS2 showed an inhibitory effect against *C. difficile* 630 and R20291 with MIC values of 10-15 and 15-20 µg/ml. Consistently, both LS1 and LS2 showed an inhibitory effect against *C. difficile* 630 and R20291 over time with a dose-dependent effect in all concentrations for the time-kill kinetic assay. Meanwhile, AA only showed slight inhibition against *C. difficile* R20291 in concentration 20 µg/ml, while AT1 did not show any inhibition at all concentrations for both experiments. In conclusion, AA derivatives LS1 and LS2 have a high potential inhibitory effect against *C. difficile* 630 and R20291, while AT1 does not.

Keywords: *C. difficile, antimicrobial agent, CDI, asiatic acid*