Antibacterial activity and toxicity of Duckweed, Lemna minor L. (Arales: Lemnaceae) from Malaysia

ABSTRACT

Aims: New therapeutics are needed to ease the prevailing waterborne disease, and one of the alternatives is by exploring the natural compounds with antimicrobial properties. Duckweed, Lemna sp. is recorded as a medicinal herb that known to have antifungal and antibacterial activities towards several fungi and bacteria. Suitability of duckweed (Lemna minor) as an antibacterial resource against selected waterborne bacteria were evaluated in terms of its antibacterial activity and toxicity.

Methodology and results: Antibacterial activity of the duckweed methanolic extract was tested against 11 selected waterborne bacteria using disc diffusion, minimum inhibition concentration (MIC) and minimum bactericidal concentration (MBC) assay. Brine shrimp lethality assay was used to determine the toxicity of this extract. The lethal concentrations of plant extract resulting in 50% mortality of the brine shrimp (LC50) were then determined.

Conclusion, significance and impact of study: Results showed that duckweed extract exhibited bacteriostatic and bactericidal against the selected bacteria activity at the concentration of MIC = 1.8-2.0 mg/mL and MBC ≥ 2.0 mg/mL. This study shows that methanolic extract of L. minor may contain bioactive compounds against bacteria and potential therapeutic effect. The crude extract is slightly toxic and may not safe to be used in high concentration but is valuable in further study as a potential antitumor agent.

Keyword: Antimicrobial resistance; Bacteriostatic; Bactericidal; Brine shrimp; Therapeutic