

Colloquium on Applied Sciences 2 2024

8-14 July 2024, Faculty of Applied Sciences, UiTM Shah Alam, Malaysia

Cultivation Of Azolla and The Antimicrobial Properties of Fermented Azolla with Lactobacillus Bacteria

Najwa Abu Hassan^a, Farizan Aris^{a*}

Structured Abstract

Background: Azolla, known for its remarkable nutrient composition, has attracted significant interest as a viable substitute feed in the chicken industry. The plant's rapid growth and simple cultivation process make it a practical choice for improving the quality of animal feed while also reducing costs. In addition, Azolla has the potential to exhibit antibacterial and antifungal activities, especially when it is fermented with Lactobacillus bacteria. The objective of this study is to analyse the optimum conditions for the cultivation of Azolla in Malaysian climate, to isolate Lactic acid bacteria from a common probiotic drink and to determine the antimicrobial properties of fermented Azolla with Lactobacillus

Methods: The Azolla was cultivated at three different parameters: 5, 10 and 20 cm of water depth, 30, 50 and 100% of sun exposure and 5, 6, 7 and 8 pH manipulation. The harvested Azolla was fermented with Lactobacillus bacteria for 3 days before analysed for the antimicrobial property. The antibacterial assay was done using disc diffusion assay against *Salmonella sp.* at 3 different days of fermentation. The antifungal assay also was done using agar well diffusion assay on Potato Dextrose Agar against *Aspergillus sp.* and *Candida Albicans*.

Results: The result of this study shows that the optimal conditions for Azolla to grow in Malaysian climate is at water depth of 10 cm, 100% of sun exposure and pH of 5.0. The fermentation of Azolla with Lactobacillus has shown a significant result in the antimicrobial property. Fermented Azolla did not inhibit the growth of *Salmonella sp.* in the antibacterial assay while for the antifungal assay, this study discovered that Azolla exhibits a favourable outcome of its antifungal efficacy against fungi. A zone of inhibition approximately 14.90 mm was observed against *Candida Albicans*.

Conclusion: This study found that Azolla grows best in Malaysian climates at 10 cm water depth, 100% sun exposure, and pH 5. This study found no antibacterial activity in fermented Azolla, suggesting more research is needed to understand its antibacterial properties. Fermented Azolla possesses antifungal properties, highlighting the importance of microbial targeting to extend the feed pellets' shelf life.

Keywords: Azolla, Fermentation with Lactobacillus bacteria, Cultivation of Azolla, Antibacterial, Antifungal

*Correspondence: farizan@uitm.edu.my

^aSchool of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia