

Brought to you by [INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA](#)

Scopus

[Back](#)

A Laboratory Framework for Evaluating Antimicrobial Activity in Herbal Soaps: A Model System Using Neem and Turmeric Formulations

[Malaysian Applied Biology](#) • Article • [Open Access](#) • 2026 •

DOI: 10.55230/mabjournal.v55i3.3908

[Hashim, Nur Izzati Husna](#); [Alias, Norsyuhada](#)

Department of Biomedical Science, Kulliyah of Allied Health Sciences, International Islamic University Malaysia (IIUM), Pahang, Kuantan, 25200, Malaysia

[Show all information](#)

0

Citations

[Full text](#) [Export](#) [Save to list](#)[Document](#)[Impact](#)[Cited by \(0\)](#)[References \(30\)](#)[Similar documents](#)

Abstract

The rising concern of skin infections caused by common microbes like *Staphylococcus aureus* and *Candida albicans* exacerbated by increased antimicrobial resistance from overuse of conventional drugs has increased the public's interest in natural and herbal-based products. While commercial medicated soaps have extensive studies on their antimicrobial activities, existing research on herbal soaps predominantly focuses on plant extracts rather than finished soap formulations, leaving a gap in understanding the true efficacy of herbal-based soaps against clinically relevant pathogens. Additionally, variations in preparation methods and the absence of standardised testing protocols complicate the comparison and validation of results across different studies. The study aims to evaluate the antimicrobial efficacy of herbal-based soaps using standardised laboratory procedures. A broth microdilution assay was conducted, followed by subculture confirmation to determine the

minimum inhibitory concentrations (MICs), minimum bactericidal (MBC) and fungicidal (MFC) concentrations. Time-kill assay assessed concentration-and time-dependent effects at MBC/MFC levels through serial dilutions and colony-forming units (CFU) enumeration. The MIC and MBC values for *Staphylococcus aureus* were 53.33 mg/mL and 80 mg/mL, respectively, with time-kill analysis showing bacterial reduction within 30 s and complete elimination by 3 min. *Candida albicans* exhibited higher MIC and MFC values of 120 mg/mL, with complete inhibition observed at 4 min. Overall, the low MIC values and rapid microbial inhibition highlight the influence of soap concentration and exposure time on its potency. Overall, this investigation not only demonstrated the microbial reduction capability of the herbal soap but also contributed valuable methodological insights. By providing a useful testing framework, it paves the way for ongoing improvements in product formulation and ensures that consistent efficacy standards can be maintained. This contributes to the broader field of natural product development and supports the increasing interest in plant-based antimicrobial agents as safe and effective alternatives to conventional chemicals. © 2026 Malaysian Society of Applied Biology.

Author keywords

Antimicrobial; broth microdilution; herbal soaps; minimum inhibitory concentration; time-kill assay

Corresponding authors

Corresponding
author

N. Alias

Affiliation

Department of Biomedical Science, Kulliyah of Allied Health Sciences,
International Islamic University Malaysia (IIUM), Pahang, Kuantan, 25200,
Malaysia

Email address

norsyuhada_alias@iium.edu.my

© Copyright 2026 Elsevier B.V., All rights reserved.

Abstract

Author keywords

Corresponding authors

About Scopus

[What is Scopus](#)[Content coverage](#)[Scopus blog](#)[Scopus API](#)[Privacy matters](#)

Language

[日本語版を表示する](#)[查看简体中文版本](#)[查看繁體中文版本](#)[Просмотр версии на русском языке](#)

Customer Service

[Help](#)[Tutorials](#)[Contact us](#)

ELSEVIER

[Terms and conditions](#) ↗ [Privacy policy](#) ↗ [Cookies settings](#)

All content on this site: Copyright © 2026 [Elsevier B.V.](#) ↗, its licensors, and contributors. All rights are reserved, including those for text and data mining, AI training, and similar technologies. For all open access content, the relevant licensing terms apply.

