UNIVERSITI TEKNOLOGI MARA | Fakulti Sains Gunaan

SUBMISSION FOR EVALUATION
FINAL YEAR PROJECT 2 - RESEARCH PROJECT

PHYTOCHEMICAL SCREENING AND PRELIMINARY INVESTIGATION OF MOMORDICA CHARANTIA EXTRACTS FOR ANTIMICROBIAL DEODORANT APPLICATIONS

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Final Year Project Report Submitted in
Partial Fulfilment of the Requirements for the
Degree of Bachelor of Science (Hons.) Applied Chemistry
in the Faculty of Applied Sciences
Universiti Teknologi MARA

AUGUST 2025

ABSTRACT

This preliminary research investigates the potential of *Momordica charantia* (bitter melon) extracts which is momordicine - a triterpenoid saponin - as an active antimicrobial ingredient in deodorant stick products. This research aimed to extract, identify and characterize bioactive compounds from seeds and leaves of *Momordica charantia* and evaluate their antimicrobial activity against *Staphylococcus hominis*, a skin-resident bacterium that contributes to body odor. Extraction was performed via maceration by using ethanol as a solvent for extraction, and the presence of triterpenoid saponins was confirmed through qualitative phytochemical analysis that Liebermann-Burchard, and saponins test and FTIR-ATR spectral analysis. A broad band at 3362.31 cm^{-1} indicates O–H stretching, typical of saponin glycone and phenolic groups. The C–H stretching at 2926.37 cm^{-1} reflects aliphatic –CH/CH_2 groups, consistent with triterpenoid backbones. A peak at 1641.8 cm^{-1} suggests C=C or conjugated C=O, characteristic of aglycone structures. Bending vibrations at 1455.01 and 1377.97 cm^{-1} indicate CH_2 and CH_3 groups, while peaks at 1079.37 and 1037.77 cm^{-1} correspond to C–O bonds, associated with esters, ethers, or alcohols. A minor peak at 689.21 cm^{-1} suggests aromatic C–H bending, possibly from co-extracted phenolic compounds. These findings align with previous studies, supporting the identification and bioactive potential of momordicine II. The identification of active constituents was effectively accomplished. However, antimicrobial assessment of the crude ethanolic extracts against *Staphylococcus hominis* using the agar well diffusion assay did not yield measurable zones of inhibition under the tested conditions. This lack of observed activity suggests potential challenges requiring further

investigation such as compound solubility, diffusion limitations within assay matrix, or bacteria resistance mechanism.

Furthermore, three deodorant formulations with varied oil - to - wax ratios (1:1, 1:5, 1:10) were prepared by candelilla wax and coconut oil. These formulations were physically stable but exhibited a hard texture unsuitable for smooth skin application. Despite limited antimicrobial efficacy and formulation challenges, this study provides a foundational framework for future research on *Momordica charantia* - based personal care products. Recommendation for subsequent work includes optimization of extraction techniques, incorporating of solubility - enhancing delivery system and refinement of formulation texture.

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