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DEVELOPMENT OF HERBAL SUNSCREEN STICK USING HARUMANIS MANGO (*Mangifera indica* Linn.) LEAF EXTRACTS

Name	:	UMI AISYAH BINTI AZMAN
Student ID	:	2022697734
Program	:	AS222
Course code	:	FSG631
Mobile Phone	:	
E-mail	:	2022697734@student.uitm.edu.my

Approval by Main Supervisor:

I certify that the work conducted by the above student is completed and approve this research proposal report to be submitted for evaluation.

Supervisor's name	:	YUSWANIE MD YUSOF
Date	:	15/2/2026
Turnitin Similarity %	:	6%
Signature	:	

DEVELOPMENT OF HERBAL SUNSCREEN STICK USING HARUMANIS MANGO (*Mangifera indica* Linn.) LEAF EXTRACTS

UMI AISYAH BINTI AZMAN

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Universiti Teknologi MARA

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This Final Year Project Report entitled "**Development of Herbal Sunscreen Stick Using Harumanis Mango (*Mangifera indica* Linn.) Leaf Extract**" was submitted by Umi Aisyah binti Azman in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry With Management, in the Faculty of Applied Sciences, and was approved by

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Yuswanie Md Yusof
Supervisor
B.Sc. (Hons) Applied Chemistry
Faculty of Applied Sciences
Universiti Teknologi Mara
02600 Arau
Perlis

_____

Farhana Binti Othman
Project Coordinator
B.Sc. (Hons) Chemistry with Management
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

_____

Dr Nur Nasulhah Binti Kasim
Head Centre of Studies
B.Sc. (Hons) Chemistry with Management
Faculty of Applied Sciences
Universiti Teknologi MARA
02600 Arau
Perlis

Date: _____

ABSTRACT

DEVELOPMENT OF HERBAL SUNSCREEN STICK USING HARUMANIS MANGO (*Mangifera indica* Linn.) LEAF EXTRACTS

Excessive exposure to ultraviolet (UV) radiation causes significant skin damage, photoaging, and skin cancer, emphasizing the need for effective and safe sun protection. Conventional sunscreens often contain synthetic UV filters, which have raised concerns regarding skin irritation and environmental impact, thereby stimulating renewed interest in natural alternatives. This study aimed to formulate and evaluate a herbal sunscreen stick incorporating Harumanis mango (*Mangifera indica* Linn.) leaf extract as a natural photoprotective agent. The leaves were extracted using microwave-assisted extraction (MAE) with a 70:30 ethanol-water solvent system, yielding 21.26% (w/w) crude extract. *In-vitro* testing showed that SPF increased with extract concentration, reaching a maximum value of 36.19±0.62 at 7,500 ppm, indicating ultra protection against UVB radiation. The extract concentration exhibiting the highest SPF was incorporated into a sunscreen stick formulation containing beeswax, shea butter, coconut oil, essential oil and cetyl alcohol. The final product showed skin-friendly pH range of 5.49-5.67, a melting point of 54.9-55.0 °C, proper homogeneity, good texture and spreadability. The *in-vitro* SPF of the formulated sunscreen was 18.53±0.52, providing moderate UVB protection for daily use. Overall, the study concluded that Harumanis mango leaf extract possesses significant photoprotective potential and can be successfully incorporated into a stable herbal sunscreen stick, promoting the use of plant-derived bioactive compounds as natural and eco-friendly alternative to synthetic sunscreen ingredients.

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