

3rd EDITION

E-EXTENDED

ABSTRACT

**INTERNATIONAL
AGROTECHNOLOGY
INNOVATION
SYMPOSIUM (i-AIS)**



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INTERNATIONAL AGROTECHNOLOGY INNOVATION SYMPOSIUM (i-AIS)

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ABOUT FACULTY OF PLANTATION AND AGROTECHNOLOGY

The Faculty of Plantation and Agrotechnology was established in 2010 at Universiti Teknologi MARA (UiTM). The mission of the faculty is to play the vital role of producing well-trained professionals in all areas of plantation and agriculture-related industries at national and international levels.

Bachelor of Science (Hons) Plantation Technology and Management is a three-year program that strongly emphasizes the various aspects of Production Technology, Management, and Information Technology highly sought after by the agricultural and plantation sectors. Students in this program will be fully trained to serve as professionals in the plantation sector and related industries. They will have ample opportunities to fulfill important positions in the plantation industry such as plantation executives. This program provides a strong balance of technology and management courses essential for the plantation industry such as management of plantation crops, soil fertility, plantation management operation, plantation crop mechanization, and agricultural precision. As an integral part of the program, students will be required to undergo industrial attachment to gain managerial skills in the plantation industry.

The faculty is highly committed to disseminating, imparting, and fostering intellectual development and research to meet the changing needs of the plantation and agriculture sectors. With this regard, numerous undergraduate and postgraduate programs have been offered by the government's intention to produce professionals and entrepreneurs who are knowledgeable and highly skilled in the plantation, agriculture, and agrotechnology sectors.

PREFACE

International Agrotechnology Innovation Symposium (i-AIS) is a platform to be formed for students/lecturers/staff to share creativity in applying the knowledge that is related to the world of Agrotechnology in the form of posters. This virtual poster competition takes place on the 1st of December 2022 and ends on the 8th of January 2023. This competition is an assessment of students in determining the level of understanding, creativity, and group work for the subject related to agrotechnology and being able to apply it to the field of Agrotechnology. The i-AIS 2022 program takes place from December 1, 2022, to January 8, 2023. The program was officiated by the Dean of the Faculty of Plantation and Agrotechnology, namely Prof. Madya Ts. Dr. Azma Yusuf. The program involves students from faculties of the Faculty of Plantation and Agrotechnology (FPA) and HEP participating in i-AIS 2022, namely, the Faculty of Education and Pre-Higher Education. This program involves the UiTM student and some of the non-UiTM students which come from the international university and the local university. Two categories are contested, namely UiTM and non-UiTM. To date, students from these programs have shown remarkable achievements in academic performance and participation in national as well as international competitions.

This competition is an open door for the students and lecturers to exhibit creative minds stemming from curiosity. Several e-content projects have been evaluated by esteemed judges and that has led to the birth of this E-Poster Book. Ideas and novelties are celebrated, and participants are applauded for displaying ingenious minds in their ideas.

It is hoped that such an effort continues to breed so that there is always an outlet for these creative minds to grow.

Thank you.

Dean
On behalf of the Organizing Committee
Conference Chair
Universiti Teknologi MARA
Faculty of Plantation and Agrotechnology
<http://fpa.uitm.edu.my>

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COCOA BUTTER KERNEL BODY SCRUB

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ABSTRACT - Cocoa body scrub was formulated with cocoa butter without addition of emollient agent, and and kernel oil palm as exfoliating agent. Cocoa butter is decent source of vitamin E which benefits for skin which is contain high amount of fatty acid which make it well suited as a primary ingredient for scrub. Besides, the phytochemicals in cocoa butter may protect against skin damage from harmful UV rays and lower your risk of skin disease. Addition with palm kernel oil is a vegetable oil derived from *Elaeis guineensis* with a beneficial effect in moisturizing the skin and preventing transdermal heat and water loss. Palm kernel oil contains fatty acids, especially lauric acid at 46-52%. Lauric acid has the properties of hardening, cleaning, producing foam and softening that is needed for making scrub. The stability of product was evaluated by freeze and thaw stability cycle and accelerated stability method. The freeze/thaw stability cycle was carried out by stressing the product under 4 °C for 24 hour and the following 24 hours under 40°C and repeated several time. The purpose of study to aim how cocoa butter and kernel oil palm will be produce into scrub that will be formulated with this two main ingredient.

Keywords: Cocoa butter, kernel oil palm, scrub, fatty acid, phytochemicals, lauric acids

INTRODUCTION

The stratum corneum acquires a layer of dead skin due to daily to the environment and natural body keratinization, which result in thicker, older-looking skin. However, depending on age, this dead skin with gradually shed off in two week or longer. However, the removal of the old, dead skin layer sped up by using an exfoliating cosmetic product. This can be done either chemically or physically, and it will leave you with a younger looking, suppler, smoother new skin layer.

By using a cosmetic product with particle material of 10/400 mesh, the dead skin layer may also physically remove. The particle exfoliating agent, weather artificial or natural is often an inert component of the product with the capacity to remove the stratum corneum or loose stratum corneum flakes and polish the skin. However, using body scrub too frequently might irritate some people. According to some estimate, using body scrub is equivalent to two to three times peeling tape. Polyethylene beads are typically used as scouring agent but natural product like as sugar, powdered seed husk, and loofah are also used in body scrubs.

But, because of mixing with palm kernel oil that has greatest lauric acid concentration (46-52%), it may be used to make soap that have also the scrub. Lauric acid is present in palm kernel oil (PKO) in amount of 47.8% compared to 0.2 % in palm oil. One of the essential fatty acids used to make soap, lauric acid possesses foaming, softening, and cleansing characteristic. Bath soap in one of the soap innovation products that will be mixed with the ingredient that will form a body scrub to make it more attractive. Factor that can affect the soap of combination of ethanol, sucrose, and glycerine.

Cocoa body scrub

Cocoa is the important ingredient in hydrating skin because it helps lock in moisture, while the other ingredients help soothe and nourish the skin. Cocoa body scrub that mixed with the palm kernel oil gives many benefits to the skin. Besides gave the moisture to the skin, it also helps fight eczema and wrinkles, prevent acne breakouts while removing impurities and dead skin for a rejuvenated complexion.

The purpose of this paper is to make and show the new combination of cocoa body scrub with a new ingredient which is palm kernel oil.

MATERIAL AND METHOD

Preparation of Cocoa Body kernel Scrub

The formulation is show in Table 1 for Cocoa butter kernel body scrub formula is summarized in Table 1. Part A is water phase and part B is the oil phase, while part C represents the miscellaneous ingredient as in this case ground CPH and fragrance.

Table 1: Formulation of body scrub

Ingredient	Function	Weight percentage, wt%
Part A		Cocoa body kernel scrub
Water, Deionised	To dilute	50-60
Thickener	To thicken the formulation	0.50 - 1.00
Perservative	To preserve	0.50 - 1.00
Surfactant	Ease of washing after application	5.0 - 10.0
Part B		
Cocoa Butter	Emollient	15.0-25.0
Emulsifier	To emulsify the water and oil phase	4.0-5.0
Sorbitol	Humectants	3.0-3.5
Glycerin	Humectants	3.0-3.5
Part C		
Kernel oil palm	Exfoliating particular 425 μ m	1.0-2.0
Fragrance	Odour properties of the product	q.s
Total		100.00

To make the cream, melt cocoa butter prior to the addition of sorbitol, glycerine, and emulsifier, and heated to 75°C. Separately, in another beaker, thickener was soaked in deionised water until hydrated prior to the addition of preservative and heated to 75°C. Then, part B was poured into part A and homogenized for 15 minutes. The mixture was then cooled down to 40°C with continuous agitation before the addition of part C, then promoted into container and left for 24 hours or overnight to set.

After this, the physical properties of the cosmetic product were measured, initially, to make sure the formula is well set, and the ingredients were mixed and structured very well.

RESULTS AND DISCUSSION

Cocoa butter kernel body scrub incorporation into cosmetic products necessitates proper handling and processing, particularly the suitable formulation temperature and quantity in the formulation. Although the flaw of the product may be concealed in a variety of ways, such as the addition of thickening and scents, a better product can be obtained by using the appropriate component amount and temperature to gain the benefits of natural goods. As an emulsion product, this cocoa butter kernel body scrub would require an emulsifier to avoid separation or instability. The use of suitable amounts of thickener improves the emulsion product's stability. Because of their interaction with the water element of the formulation, the thickener delays the thermodynamic breakdown of the emulsion and thus exhibits emulsifier behavior. Meanwhile, separation of water from oil phase, or vice versa, is also prevented by heating heated oil and water phase to 75°C before to combining in the homogenization process.

These activities are critical for producing a stable emulsion. During homogenization, the oil phase is reduced to tiny droplets, allowing it to spend more time in the water phase. As a result, the heating step prior to mixing is designed to achieve the same liquid temperature across the phases in order to form a stable structure. Furthermore, poor mixing and heating of the cocoa product might result in blooming, as occurs in chocolate production. When the crystalline structure of cocoa is not adequately established during the formulation, the blooming effect occurs. Figure 1 depicts the blooming of cocoa butter scrub as a result of incorrect formulation processing. Initially, the cocoa butter kernel body scrub was made using kernel oil, and the kernel oil were mixed in immediately. Because of the resin component in the kernel oil that was ejected over time in the presence of water in the formulation, the product turned slimy and brownish. At the same time, the product exhibited an inconsistent texture due to the fact that unprocessed kernel oil contains varying particle sizes. This also contributed to the grittiness and off-odor upon application. However, following kernel oil treatment, the finished product seemed to have a white foundation with kernel oil equally distributed throughout, which was more attractive Figure 2 and acceptable.



Figure 1: Blooming of Cocoa butter Body Scrub



Figure 2: Cocoa butter kernel Body Scrub

CONCLUSION

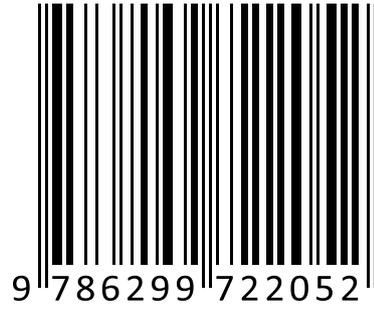
To get the most out of the two components combined, the cocoa body scrub should be processed and prepared at 70°C. To learn about further possible cosmetic advantages of the palm kernel oil, further research is needed. To ensure that the product can reach the consumer's hand without flaws, the shelf life of the product must be evaluated.

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