UNIVERSITI TEKNOLOGI MARA

THE DETERMINATION OF ANTIOXIDANT AND ANTIMICROBIAL ANALYSIS OF GAHARU ESSENTIAL OIL AND GAHARU LEAVES IN SOAP FORMULATIONS

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ABSTRACT

The rapid incorporation of synthetic chemicals in daily personal skin care products is increasing from day to day. The definition of personal skin care product has evolved from the very basic definition of cleansing medium towards the medium to cleanse, transfer scents and conditioning agents, antibacterial agent and antioxidant agents. The bunch of chemicals are added into the products that increase its complexity of interaction between one chemical to another. Therefore, to cope with that situation a bunch of chemicals are added to stabilize the components and to aid in processing. This condition affects the availability of natural skin care products in the market. The aim of this study is to determine the characteristics of natural source towards the development of personal skin care products. The highlight was given on the antioxidant and antibacterial activity of the natural materials. The abundant availability of Gaharu plants and the unique formation of oleoresin make it reliable to be analysed. In this study, the new utilization of gaharu leaves and essential oil was conducted by addition into the soap formulation. Six different soap formulation were prepared using hot process soap making. The analysis in the soap performance was conducted on the soap stability such as appearance attribute, pH and foaming ability. Furthermore, antioxidant and antibacterial abilities was conducted using 2,2-DiphenylPicrylHydrazyl (DPPH) assays and Kirby Bauer Disk Diffusion assay respectively. This study shows that the soap samples added with gaharu essential oil provides a good soap attribute such as appearance, odour and good antioxidant activity while the soap samples added with gaharu leaves yield no added attribute such as good odour and pleasant appearance but possess a good antioxidant free radical scavenging activity of 71.83 percent with the IC 50 of 5.22 mg/ml. The antimicrobial analysis shows highest inhibition of 9 mm and 14 mm for coconut soap subjected to Lactobacillus and E-Coli respectively while olive soap exhibit minimal zone of inhibition of 7 mm and 10 mm respectively. In conclusion, gaharu essential oil and leaves are the suitable alternative to be used as additives in personal skin care products.

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TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION

1.1 PROCESS BACKGROUND

1.1.1 History of Soap

The existence of soap like substances was first discovered dating back to the ancient civilization era which include the Babylon, ancient Egypt, Greek and Roman. Discovery of soap was first revealed during the Babylonian times where a soap-like material found in clay cylinders during the excavation of ancient Babylon. Inscriptions on the cylinders say that fats were boiled with ashes, a soap-making method (Leven, 1954). Legends believed that soap was named after Mount Sapo, an ancient site of animal sacrifices. After an animal sacrifice, rain would wash animal fat and ash, that collected under the ceremonial altars, down to the banks of the Tiber River located at central of Italy. Moreover, the finding on the soap begin with the washing activity conducted by women at that time, which identify that yellowish area on the river does provide a cleaner washing ability after the heavy rain bring the runoff water together with fat of sacrificial animal (Fatty acid) and wood ashes (alkali) used in the ritual.

1.1.2 Soap Components and Performance Criteria

Triglyceride of fatty acid can be derived from plant and animal based while alkali used can be categorized into sodium and potassium based that produce soft and hard soap respectively. Both of this component is a building block in soap making process. Recently, the development in soap production can be seen through addition of fragrance, colorant and additives that enhance the soap physiochemical property and to match up the compatibility between the components. This development also due to the customer personal preferences regarding on the functionality required. Moreover, common additives that is incorporated into the component is emollients, humectant and moisturizer, occlusive agents, dermabrasive agent, primary and secondary surfactant, anti-irritant and anti-microbial agent and preservatives. Besides that, the effect of the