# CHAPTER I
# INTRODUCTION

## 1.1 Background

Skincare has become one of the most important concerns in today's global era, not only among women but also men who seek healthy skin. Global warming leads to increased absorption of ultraviolet (UV) rays, posing a threat to the skin. UV rays can damage the skin, cause sunburn, and even penetrate deeper skin layers, damaging DNA and inducing skin aging (photoaging). Environmental air pollution is another factor contributing to skin damage, requiring individuals to consistently protect their skin from the effects of pollution, such as free radicals, which are also known as *reactive oxygen species*[1].

A large number of free radicals can be harmful to the skin, triggering aging, skin tissue inflammation, and causing issues such as wrinkles and pigmentation. Free radical components can interact synergistically with ultraviolet rays, increasing the probability of undesirable effects that may harm skin health. To counteract the harmful effects of free radical exposure, compounds capable of capturing or neutralizing them are needed[2].

Compounds that have the potential to capture free radicals are called antioxidants. Antioxidants can stabilize free radicals by donating a hydrogen atom or a single electron to them. Antioxidants can be found in various types of plants, one of which is the arumanis mango leaves[3].

Arum manis mango leaves (*Mangifera indica L.* var. arum manis) contain several beneficial compounds, such as phenolic compounds, flavonoids, and tannins, including in the leaves. Phenolic compounds provide benefits for the skin, particularly as antioxidants[4]. The arum manis mango leaves used in the

[1] Andarina, T. Djauhari. (2017). "Antioksidan dalam dermatologi," *Jurnal Kesehatan Kefarmasian*, Vol. 4, No.1, Hal: 39-48
[2] I Made Oka A.P. (2016). "*Kimia Terapan*". Program Pascasarjana Universitas Udayana. Hal:11
[3] Melanie cornelia dan Joshua. (2019). "Pemanfaatan Daun Mangga Arum Manis (*Mangifera Indica L.*) Sebagai Minuman Teh Celup" *Jurnal Sains Dan Teknologi*.
[4] Dwi Omiarni. (2019). "Formulasi Lotion Dari Fraksi Daun Mangga Arum Manis (Mangifera indica L.)". Karya tulis ilmiah. Hal:1

formulation will be in the form of an extract obtained through the maceration method[5]. Mango leaves extract is rich in antioxidant compounds that are beneficial for the skin, making it suitable for incorporation into formulations such as lotions or body creams[6].

Body cream is a skincare product designed to moisturize and protect the skin from environmental factors. The most popular type of body cream in society is oil-in-water (O/W) based. O/W body cream is an oil-in-water emulsion similar to lotion but contains a higher amount of oil and humectants, with the oil phase making up 15-40% and humectants 5-15%. This type of body cream is easily absorbed by the skin after application[7]. The body cream to be formulated will use natural humectants in the form of yogurt[8].

Yogurt is a natural ingredient that can be used in body cream formulations due to its beneficial properties for skin health. It contains lactic acid and alpha hydroxy acid (AHA), both of which help remove dead skin cells that accumulate on the skin. This process also contributes to increasing skin moisture and keeping the skin well-nourished[9]. The researcher aims to develop a formulation that helps maintain skin moisture in the form of a body cream containing arum manis mango leaves extract (*Mangifera indica L*. var. arum manis) and yogurt, both of which possess antioxidant effects beneficial for the body[10].

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[5] Riska Yudhistia Asworo, Hanandayu Widwiastuti. (2021). "Pengaruh Ukuran Serbuk Simplisia dan Waktu Maserasi terhadap Aktivitas Antioksidan Ekstrak Kulit Sirsak". *Indonesian Journal of Pharmaceutical Education*. Hal: 257

[6] Nadia Isnaini, Vicky Prajaputra, Siti Maryam. (2023). "Formulation and Evaluation of O/W Body Cream Containing Patchouli Oil (*Pogostemon cablin Benth.*) and Drumstick Oil (*Moringa Oleiffera*) as Potential Moisturizing Agent". *Jurnal Penelitian Pendidikan IPA*. Universitas Syiah Banda Aceh

[7] Dewi Ayu Ika, James Sibarani, Ni Made Suaniti. (2017). "Sifat Fisikokimia Hand and Body Cream Dengan Pemanfaatan Ekstrak Etanol Bunga Gemitir (*Tagetes erecta L.*) Dan Bunga Pcar Air Merah (*Impatients balsamina L.*) Dari Limbah Canang". *Indonesian E-Jurnal of apllied Chemistri*. Hal: 2

[8] Naglaa Hani El-Abbadi, dkk. (2014). "Yogurt: Role in Healthy and Active Aging". *The American Journal Nutrition*. Volume 99. Hal: 1263-1270

[9] Shelly Dwi Agata, dan Lukky Jayadi. (2022). "Formulasi Lulur *Body Scrub* Beras Ketan Hitam (*Oryza sativa var. glutinosa*) Dengan Perpaduan Yogurt Sebagai Zat Aktif". *Jurnal Riset Kefarmasian Indonesia*. Hal: 332-352.

[10] Hery Winarsi, Aisyah Tri Septiana, Kartini, Iva Nurul Hanifah. (2019). "Fermentasi Bakteri-Asam-Laktat Meningkatkan Kandungan Fenolik Dan Serat Yogurt Susu Kecambah Kacang Merah (*Phaseolus Vulgaris L.),* Minuman Fungsional Untuk Obesitas". *Jurnal Gipas*. Volume 3 No. 1

## 1.2 Problem Formulation

The problem formulations in this study are:

1. How is the quality evaluation of the body cream formulation containing arum manis mango leaves extract (*Mangifera indica L.* var. arum manis) and yogurt?
2. How is the antioxidant activity of the body cream formulation containing arum manis mango leaves extract (*Mangifera indica L.* var. arum manis) and yogurt?

## 1.3 Research Objective

The objectives of this study are:

1. To determine the quality evaluation of the body cream formulation combining arum manis mango leaves extract (*Mangifera indica L. var.* arum manis) and yogurt.
2. To determine the antioxidant activity of the body cream formulation containing arum manis mango leaves extract (*Mangifera indica L.* var. arum manis) and yogurt.

## 1.4 Research Benefit

### 1. Theoretical Benefit

The results of this study can be used as literature for future research on body cream formulations and other pharmacological activities of mango leaves extract and yogurt. It also enriches the scientific literature on arum manis mango leaves extract for further studies.

### 2. Practical Benefit

The results of this study are expected to provide knowledge and information to readers and other researchers regarding the body cream formulation combining mango leaves extract and yogurt. This will help in developing a body cream product with the desired antioxidant activity.



## 1.5 Originality of Research

Penelitian Research on the effects of anabolic steroids has been conducted by several researchers, as shown in the **Table.1**:

**Table 1**. Originality of Research

| Tittle Resarch | Research Method | Variable | Result | Different Research |
|---|---|---|---|---|
| Formulation of Lotion from Arum manis Mango Leaves Fraction (*Mangifera indica L.*)[11] | Experimental laboratory | **Dependent:** Formulation of Lotion from Arum Manis Mango Leaves Fraction **Independent:** Extract of Arum Manis Mango Leaves (*Mangifera indica L.*) | The research results show that the lotion formulation from the *arum manis* mango leaves fraction (*Mangifera indica L.var. arum manis*) according to the required standards for pH and viscosity tests, while the most preferred formulations in the hedonic test were F0 and F2. | **Dependent:** Formulation and Quality Evaluation of Body Cream Preparation **Independent:** Concentration of Arum manis Mango Leaves Extract (*Mangifera indica L.* var. arum manis) as an Antioxidant and Yogurt as Humectant |
| Formulation and Physical Evaluation of Body Cream Containing Black Glutinous Rice Extract (*Oryza sativa var. glutinosa*)[12] | Experimental laboratory | **Dependent:** Formulation and Physical Evaluation of Body Cream **Independent:** Containing Black Glutinous Rice Extract (*Oryza sativa var. glutinosa*) | In this study, the physical evaluation of the body cream containing black glutinous rice extract included organoleptic testing, pH testing, viscosity testing, spreadability testing, and adhesion testing, all of which met the predetermined requirements. | **Dependent:** Formulation and Quality Evaluation of Body Cream Preparation **Independent:** Concentration of Arum manis Mango Leaves Extract (*Mangifera indica L. var. arum manis*) as an Antioxidant and Yogurt as Humectant |



[11] Dwi Omiarni. (2019). "Formulasi Lotion Dari Fraksi Daun Mangga Arum Manis (*Mangifera indica L.*)". Karya tulis ilmiah. Hal:1

[12] Fidya Ikrima. (2021). "Formulasi Dan Evaluasi Fisik Sediaan Body Cream Ekstrak Ketan Hitam (*Oryza sativa var. glutinosa*)". *Jurnal Buana Farma*. Vol 1 Nomor 1. Hal:1

| Tittle Resarch | Research Method | Variable | Result | Different Research |
|---|---|---|---|---|
| Antioxidant Activity Test of Mango Leaf Cream (*Mangifera indica L.*) Using DPPH (*1,1 -diphenyl-2-picrylhydrazi*) Method[13] | Experimental laboratory | **Dependent:** Antioxidant Activity Test Cream **Independent:** Mango Leaves Cream (*Mangifera indica L.*) Using DPPH | The research results show that the ethyl acetate extract of mango leaves has very strong antioxidant activity with an IC50 value of 21.79 ppm. However, after being formulated into a cream (Formula 3), the IC50 value increased to 50.54 ppm, categorizing it as strong. The cream remained stable for 28 days without changes in color or odor and maintained a pH of 6.0 with a viscosity ranging from 2254 to 2421 cP. | **Dependent:** Formulation and Quality Evaluation of Body Cream Preparation **Independent:** Consentration of Arum manis Mango Leaves Extract (*Mangifera indica L.* var. arum manis) as an Antioxidant and Yogurt as Humectant |



[13] Lusi Nurdianti, Ira Rahmiyan. (2016). "Uji Aktivitas Antioksidan Krim Daun Mangga (*Mangifera indica L.)* terhadap DPPH (*1,1 -diphenyl-2-picrylhydrazil*)*". Jurnal Kesehatan Bakti Tunas Husada.* Volume 16, No. 1.