

# CHAPTER I

## INTRODUCTION

### A. Research Background

Indonesia is a tropical country with air humidity and relatively high air temperature reach 80% and 35<sup>0</sup>C respectively accompanied by very harsh and disturbing sunlight. The sun's rays emit ultraviolet (UV) rays that are beneficial for the body such as, synthesize vitamin D and kill bacteria.<sup>1</sup> On the other hand, UV rays that sting the body for a long time can cause skin damage, including a skin lips. It is because the lips skin is a sensitive part of the body. After all, the skin of the lips does not have hair follicles and sweat glands that function as lip protectors from outside influences.<sup>2</sup> Therefore, the lips needs a supporting tool to maintain the condition of the lips to remain in a healthy state.

Lip health must be considered because the lips are one of the external body parts that can be observed directly, as in the epidermis, hair, and nail.<sup>3</sup> Exposuring UV and other free radicals can make the lips chapped. This situation is due to the cracking of the surface keratin layer, which is triggers the keratin-producing cells does not to works optimally. so that the lip skin becomes dry and peel. It will make the lip susceptible to infection.<sup>4</sup> Lip damage makes people uncomfortable to look at and reduces the beauty value. This is contrary with the hadith,

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<sup>1</sup> Siti Hapsah Isfardiyana, "Pentingnya Melindungi Kulit Dari Sinar Ultraviolet Dan Cara Melindungi Kulit Dengan Sunblock Buatan Sendiri", Jurnal Inovasi dan Kewirusahaan Vol.3, No.2 (2014)

<sup>2</sup> Hasan, et al, "Formulasi Sediaan Pelembab Bibir Minyak Biji Anggur (*Grapseed oil*), (2018), Sumatera Selatan.

<sup>3</sup> Tranggono, R. I, *et al*, *Buku Pegangan Ilmu Pengetahuan Kosmetik*, (Jakarta: PT. Gramedia Pusaka Utama,2007), P. 11 -32.

<sup>4</sup> Muliyan, et al." A – Z Tentang Kosmetik, (2013), Jakarta: PT. Elex Media Komputindo.157-158.

which explains the recommendation to love beauty which reads:

إِنَّ اللَّهَ جَمِيلٌ يُحِبُّ الْجَمَالَ

“*Verily Allah is beautiful and loves beauty (HR Muslim)* <sup>5</sup>”

Lip cosmetics are the most popular women product for their life. Lip cosmetics are needed to maintain the artistic value of the lips. <sup>6</sup>In this modern era, there are many variations of lipstick preparations that are ready to be used to add make up aesthetics. Its preparation has been developed with various dosage forms ranging from liquid, crayon, and cream. The benefits of each forms are vary according to the type of preparation. Apart from being a tool to add aesthetics, lip cosmetics are also designed to protect the lips from free radicals that cause damage to the lips.<sup>7</sup>

Lip balm is a preparation in the form of a wax-like substance and is applied to the lips for moisturize. *Lip balm* is used as protection for the lips—designed to prevent dry and chapped lips, which can lead to irritation and infection. <sup>8</sup>It contains active compounds that can counteract free radicals. How to use *lip balm* is simple, which is enough to apply on the surface of the lips evenly so that it leaves a glossy and transparent impression. *Lip balm* is easy for various groups, both women and men.

The formulation of lip balm preparations requires additional ingredients, such as coloring elements to increase the trial’s quality and attract consumers, even though the material is not necessarily safe to use. Many products out there use harmful chemical dyes that can cause allergies, nausea, irritation, and drying of the lips. <sup>9</sup>. Due to the various side effects

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<sup>5</sup> Abi Husayn Ahmad. 1994. *Mu’jam Al Maqayis fi al Lughah*. Dar al Fikr. Cairo

<sup>6</sup> Directorate General of POM, (1985). “Indonesian Cosmetics Formulary,” Jakarta: Ministry of Health RI. Thing. 83 – 86.

<sup>7</sup> Tranggono RI, et al., (2007) “Cosmetic Science Handbook,” Jakarta: Main Library Publisher.

<sup>8</sup> Vishwasrao, “Review on natural lip balm,” *International Journal of Research Cosmetic Science*, (2015): 1-7.

<sup>9</sup> Aprilia, “Lipstick Formulation Using Beetroot Extract (*Beta Vulgaris*) As Natural Colorant” (2017). Mulawarman University.

that arise, natural dyes are needed to replace synthetic dyes. Based on the research of Asyifaa *et al.*, herbal lip cream preparations using natural dyes do not irritate and are safe to use. One of the natural ingredients can be used as a natural dye in the *lip cream preparation* is Rosella.

Natural dyes that are often used as cosmetic ingredients contain a lot of anthocyanins, carotenoids, betalains, chlorophyll, and curcumin compounds<sup>10</sup>. Butterfly pea flower is one of the plants that contain dyes with *quercetin* compounds which are useful as antioxidants and anti-inflammatories. It can reduce the effects of inflammation. The use of these natural ingredients is following Allah's commands that have been set in the Qur'an as an effort to utilize the plants that Allah has created. Allah SWT says in the QS Asy Shura (26): 7<sup>11</sup>

أَوَلَمْ يَرَوْا إِلَى الْأَرْضِ كَيْفَ أَنْبَتْنَا فِيهَا مِنْ كُلِّ زَوْجٍ كَرِيمٍ

“And do they not pay attention to the earth? How much have we grown all kinds of good plants on the earth?”

The butterfly pea is one of the particular herbal plants in traditional medicine. It is because all parts of the flower are believed to have significant benefits in treating and strengthening organ performance.<sup>12</sup> Butterfly pea is included in the source of the natural dye indigo (blue) obtained from the flower crown. Butterfly pea flower has pharmacological potential as an antioxidant, antibacterial, anti-inflammatory, and analgesic.<sup>13</sup> The ethanol extract of the butterfly

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<sup>10</sup> Hartono, Michelle, LL.M Purwijantiningsih, Sinung Pranata. 2013. “Utilization of Telang Flower Extract (*Clitoria ternatea L.*) as Natural Colorant for Ice Candles.” Yogyakarta: Atma Jaya University

<sup>11</sup> Ministry of Religion of the Republic of Indonesia. The Qur'an and its Translation. (2009) Jakarta: PT. Syigma Exemedia Arkanleema.

<sup>12</sup> Mukherjee, PK, Kumar, NS & Heinrich, M., 2008. The Ayurvedic medicine *Clitoria ternatea*- From traditional use to scientific assessment. *Journal of Ethnopharmacology*,120(3), pp 291-301.

<sup>13</sup> Budiasih, KS2017. Study of Pharmacological Potential of Telang Flower (*Clitoria ternatea*). *Proceedings of the National Chemistry Seminar*. FMIPA UNY. Page: 201-206.

pea has a performance equivalent to aspirin.<sup>14</sup> Butterfly pea contains anthocyanin as a coloring agent as much as 5.40 and 0.23 mmol/mg. So, it can be used as food coloring with a color intensity that is comparable.<sup>15</sup> In addition to the purple color of the butterfly pea flower, it can produce blue and red colors from anthocyanin compounds.<sup>16</sup>

Anthocyanins are included in the flavonoid family, which has a role as bioactive compounds as antioxidants. Anthocyanins are responsible for plants' red, orange, and purple colors. Anthocyanin antioxidants can act as an antidote to free radicals that are very active and can damage the structure and function of the body. Therefore, the antioxidants in anthocyanins consumed by the body can help maintain the immune system so that it returns to normal.<sup>17</sup> Based on clinical trials conducted by Suarez *et al.*, intake of anthocyanins or foods containing anthocyanins is believed to protect the body from cancer.

Based on several benefits from butterfly pea and its secondary metabolite content, which have many health functions, it can be used in lip preparations to protect dry and cracked skin. This has prompted researchers to utilize anthocyanins in the extract of butterfly pea flower in a study entitled "Formulation and Physical Characteristic Test of Lip Balm Preparations with Extract of Butterfly pea flower (*Clitoria ternatea L.*) as a Natural Dyes."

## B. Research Problems

1. What are the results of the characteristic test of lip balm preparations with the extract of butterfly pea (*Clitoria ternatea L.*) as a natural dye?

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<sup>14</sup> Abdullah Muzi Marpaung. Overview of the Benefits of Telang Flower (*Clitoria ternatea*) for Human Health. *Journal of Functional Food and Nutraceutical* (2020): 47-69.

<sup>15</sup> Pratimasari, *et.al.* Optimization of Telang Flower Dyes (*Clitoria ternatea*) as Natural Dyes in Paracetamol Syrup. *Manuntung Scientific Journal*. (2018) Surakarta; Samarinda Pharmacy Academy

<sup>16</sup> Migliorini, A. *et.al.* Red Chicory (*Cichorium intybus*) Extract Rich in Anthocyanins: Chemical Stability, Antioxidant Activity, and Antiproliferative Activity In Vitro. *Journal of Food Science* (2019): 990 -1001.

<sup>17</sup> Ibid.45.

2. What is the concentration of butterfly pea extract (*Clitoria ternatea L.*) that can produce appropriate preparation according to the trial's quality standard?

### C. Research Objectives

The objectives of this research are:

1. Knowing the test results of the characteristics of the lip balm preparation of butterfly pea extract (*Clitoria ternatea L.*) as a natural dye.
2. Knowing the concentration of butterfly pea extract (*Clitoria ternatea L.*) which can produce appropriate stability of the preparation according to the quality standard of the preparation

### D. Research Benefits

1. Theoretical Benefits

lip balm formulations from butterfly pea extract as a natural dye designed with an appropriate concentration for cosmetic preparations from natural ingredients and as a reference material for further research.

2. Practical Benefits

The results of this study are expected to provide additional information to the public regarding the benefits of butterfly pea as a natural dye in cosmetic preparations. In addition, it can increase the use of butterfly pea flowers.

### E. Authenticity Research

**Table 1. Research Authenticity**

Research Title	Research methods	Variable	Results	Research Differences
Utilization of Butterfly pea Extract	Experimental laboratory	<b>Dependents:</b> Natural coloring ice lolly	The results of the total anthocyanin and optimal yield of butterfly pea were obtained at the highest	<b>Dependents:</b> Natural lip balm

( <i>Clitoria ternatea</i> L.) as Natural Color for Ice Candles <sup>18</sup>		<b>Independent:</b> Butterfly pea extract ( <i>Clitoria ternatea</i> L.)	concentration of tartaric acid, namely 0.75%, with total anthocyanin and yield of 0.82 mg/ml 24.21%, respectively.	
Formulation and Evaluation of Lip Balsam Preparations Using Hibiscus Flower Extract ( <i>Hibiscus rose sinesis</i> L.) as a Natural Colorant <sup>19</sup>	Experimental research with maceration method using 96% ethanol solvent	<b>Dependents:</b> Lip balm preparation <b>Independent:</b> Hibiscus flower extract	The results of the lip balm formulation using hibiscus flower extract showed a homogeneous preparation with a melting point of 51,6 -53.6, pH 5, and stability at room temperature for four weeks.	<b>Independent:</b> Butterfly pea extract ( <i>Clitoria ternatea</i> L.)
Evaluation and Formulation of Lip Balm Preparations from Aloe Vera ( <i>Aloe Vera</i> ) and Bit Fruit Extract ( <i>Beta Vulgaris</i> ) As Natural Colorants <sup>20</sup>	Experimental without a comparison group.	<b>Dependents:</b> balm preparation <b>Independent:</b> Aloe vera extract and beetroot extract	The results showed that beetroot formulated with a concentration of 10% could provide the best lip moisturizing effect in restoring lip skin after four weeks.	<b>Independent:</b> Butterfly pea extract ( <i>Clitoria ternatea</i> L.)

<sup>18</sup> Hartono. Michelle, LL.M Purwijantiningsih, Sinung Pranata. "Utilization of Telang Flower Extract (*Clitoria ternatea* L.) as Natural Colorant for Ice Candles" (2013) Yogyakarta): Atma Jaya University

<sup>19</sup> Ratih Dyah et al., "Formulation and Evaluation of Lip Balsam Preparations Using *Hibiscus Rose Sinesis* L. Extract as Natural Dyes," *Archives Pharmacia*, Vol. 2, (2020): 92 – 101.

<sup>20</sup> Hafni Nur," Evaluation and Formulation of Lip Balm Preparation from Aloe Vera (*Aloe Vera*) and Bit (*Beta Vulgaris*) Fruit Extract as Natural Dye," *Journal of Public Health and Pharmacy*. Vol.1 (2021): 39 – 42.

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Lip Balm Formulation of Kecombrang Flower Ethanol Extract ( <i>Etilingera elatior</i> (Jack)) and Stability Test Using Freeze and Thaw Method <sup>21</sup>	Experimental	<b>Dependents:</b> <i>balm</i> preparation <b>Independent:</b> Kecombrang flower extract	The results showed that the physical quality of the kecombrang flower extract <i>lip balm</i> was stable because it did not separate at room temperature and extreme temperatures during six weeks of storage.	<b>Independent:</b> Butterfly pea extract ( <i>Clitoria ternatea L.</i> )
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<sup>21</sup> Nur Adliani, "Lipstick Formulation Using Dyes from Kecombrang Flower Extract (*Etilingera elatior* (Jack) RMSm.)" *Journal of Pharmaceutics and Pharmacology*. Vol. 1(2). (2012): 87-94.