

## UTILIZATION OF TURMERIC RHIZOME EXTRACT (*Curcuma domestica* v.) AS A DYE IN HAIR DYE PREPARATIONS

Meyana Marbun<sup>1</sup>, Arsiaty Sumule<sup>2</sup>, Yulia Delfahedah<sup>3</sup>, Muharti Sanjaya<sup>4</sup>, Dilla Sastia Mara<sup>5</sup>

Lecturer at Universitas Efarina

---

### *Abstract*

*Hair coloring preparations are cosmetic preparations used in hair cosmetology to color hair, either to restore the original hair color or another color. Turmeric rhizome contains alkaloids, flavanoid tannins and essential oils. The purpose of this study was to determine the chemical compounds contained in turmeric rhizome, to make turmeric rhizome change the color of gray hair. Hair dye preparation is made with a formula consisting of a concentration of turmeric extract rhizome, namely 20%. This research method is experimental by using maceration method. Physical evaluation carried out included homogeneity test, irritation test, color stability test against sun exposure, color stability test against washing. The results of this study indicate that turmeric rhizome extract can affect the color of the gray hair obtained. The stability test against washing can last for 5 times washing, the stability test against sunlight shows that the hair turns darker than before.*

**Keywords:** Turmeric rhizome ethanol extract, Hair dye

---

### INTRODUCTION

Cosmetics comes from the word Kosmein (Greek) which means "embellishment". beauty (Wasitaatmaja, S, 1997). Hair apart from being the crown of beauty for women, also functions as a skin barrier. Firstly, as a protector against physical stimuli such as heat, cold, humidity, and light. various chemicals and sweat (Barigina and Ideawati, 2001). Hair is a hair that grows from the scalp. The part of the hair that comes out of the skin is called the hair shaft (Tranggono and Latifah, 2007) The hair shaft is the placement of horn cells that differ in length, thickness, and color. does not hurt when trimmed (Bariqina and Ideawati, 2001). When you reach old age, the hair color turns white, and this is often undesirable (Wasitaatmadja, 1997). Hair dye preparations are cosmetics used in hair cosmetology to color hair, either to restore the original hair color or to change the original hair color to a new color (Ditjen POM, 1985).

One of the natural ingredients being tried as a hair dye is the turmeric plant (*Curcuma domestica* V.), which is an old rhizome that is dried and made into powder. In Indonesia it is grown as a traditional medicinal plant, sometimes found growing wild with a single leaf. long stem. sharp tip with smooth edges. The turmeric plant contains curcumin. The use of curcumin in the pharmaceutical field is as a natural dye in food (Anonymous, 2012). Based on the above, the authors are interested in processing and utilizing the turmeric plant (*Curcuma domestica* V.) as a hair dye.

### **Formulation of the problem**

Based on the description of the background above, it can be concluded that the formulation of the problem is:

1. Does turmeric rhizome extract (*Curcuma domestica* V.) contain a class of chemical compounds?
2. Can turmeric extract (*Curcuma domestica* V.) be used as a hair dye?
3. Can turmeric extract (*Curcuma domestica* V.) change the color of gray hair?

The contents of the introduction are the fundamental matters or the urgency of the

### **RESEARCH METHOD**

This research method is experimental. This study included simplicia preparation, extract preparation, phytochemical screening, ethanol extract preparation, simplicia characteristic examination, macroscopic examination, microscopic examination, preparation of hair dye formulations for turmeric rhizome extract preparation, use of hair dye, color stability test produced, skin irritation test, preparation homogeneity test, preparation storage test.

Preparation of turmeric rhizome extract by maceration with 96% ethanol solvent for 5x24 hours, the extraction results were filtered until a thick extract was obtained. To find out the chemical compounds contained in turmeric rhizome, a phytochemical screening test was carried out.

#### **Time and place**

This research was conducted from July to September 2019 at the pharmacy laboratory at Efarina University, Pematang Siantar, Municipality, North Sumatra.

#### **Tools**

The tools used are caterpillar knife, newsprint, grater, blender, test tube, pipette, measuring cup, beaker glass, test tube rack, stir bar, glass plate, electric stove, tongs, lighter, gauze, mortar, spatula, digital scales. preparation labels, porcelain dishes, Erlenmeyer flasks, funnels, electric cookers, preparation pots.

#### **Ingredients**

The materials used in this study were fresh turmeric rhizome extract, 96% ethanol, FeCl<sub>3</sub> reagent, water reagent (H<sub>2</sub>O), bermann-buchad reagent (LB), mayer reagent, baucardat reagent, dragendroff reagent, magnesium (Mg) reagent. a-lactol reagent. Aquabidest, pyrogalol, citric acid, glycerin, xanthan gum and copper II sulfate (CuSO<sub>4</sub>).

## RESULTS AND DISCUSSION

### Macroscopic Results

Securing the external morphology of plants such as the shape of these plants. The shape of the turmeric is oval with the outer skin of the rhizome being brownish-orange, the flesh is red-orange and yellowish. Can be seen in Appendix I.

### Microscopic results

Observing the cells using a microscope, the tissue that we observe in the turmeric rhizome is the presence of essential oils in the turmeric rhizome. Microscopic images can be seen in Appendix II.

### Results of Turmeric Rhizome Phytochemical Screening

Note:(-): exists (-): does not exist

The phytochemical results of the 96% ethanol extract of turmeric rhizome showed positive results for alkaloids, flavonoids and tannins.

In addition, turmeric rhizome also contains essential oils. Essential oils are flying oils or volatile oils which are a mixture of liquid compounds obtained from plant parts such as bark, roots, leaves, stems, fruit by distillation.

### Turmeric Rhizome Powder Extraction Results

Extraction of turmeric rhizome from 6 kg of turmeric rhizome produces 3 kg of fresh turmeric rhizome, then it is dried and then powdered to produce 500 gr. then making the ethanol extract of turmeric rhizome using the maceration method as much as 500 gr of turmeric rhizome powder dissolved in 96% ethanol as much as 500 ml to obtain a thick extract of 14 gr. trend of 2.8%). Can be attached III.

### Hair Color Formulation Results

The hair coloring preparation is made with one formula and which consists of extracts of turmeric rhizome with concentrations namely:

FI (Formula 1) -20%

From formula I, a hair dye preparation in 20% produces 4 noodle preparations in the form of a lotion with a yellow color. Can be seen in Appendix IV.

### Results of Evaluation of Hair Coloring Preparations

#### 1. Results of organoleptic examination of preparations

Research has been conducted on hair dye preparations at a concentration of 20% on physical appearance observed such as shape, the shape observed at the time of manufacture, the shape is thick and after one month the shape is still thick like lotion preparations, then the color that can be observed is yellowish orange after one month the color turns brown, and the aroma when making it smells like turmeric for one month the aroma is still there.

#### 2. The results of the preparation homogeneity test

From the results of testing the homogeneity of the preparation for the hair dye preparation with turmeric rhizome extract, the dosage form does not appear to exist as the grains do not blend, so the preparation is homogeneous, as can be seen in Appendix V.

#### 3. Irritation test results

From the results of the irritation test on hair dye preparations with turmeric rhizome extract by taking 10 volunteers, the results showed no positive reaction to skin irritation.

#### 4. The resulting color stability results

Based on the results of observations of the experiments that have been carried out, soaking gray hair from a formula made with a concentration of 20% can be seen in table III.

### CLOSING

1. The shape of the turmeric rhizome is oval, the outer skin of the rhizome is brownish orange, the flesh is red orange to yellowish.
2. The presence of essential oils in the turmeric rhizome was observed under a microscope.
3. On the phytochemical screening, the turmeric rhizome was positive for containing alkaloids, flavonoids and tannins.
4. Extraction of turmeric rhizome from 6 kg of turmeric rhizome yields 3 kg of fresh or peeled turmeric rhizome, dried and then powdered to produce 500 gr, and manufacture of ethanol extract of turmeric rhizome using the maceration method as much as 500 gr of turmeric rhizome powder dissolved in 96% ethanol 500 ml obtained 14 gr condensed extract (2.8% yield).
5. Turmeric rhizome extract can be formulated as a natural hair dye which is formulated with a concentration that produces a yellow color. The hair dye preparation of turmeric rhizome extract is in the form of lotion, has a distinctive aroma, while for stability to washing it lasts 15 times washing from dark yellow to brownish yellow, and stability to sun exposure changes slightly darker than before.
6. Based on the research results it was found that the color change that led to formula I (20%) consisted of 10 kg of turmeric rhizome extract. pyrogall 0.3 gr. Copper II sulfate (CuSO<sub>4</sub>) 0.3 gr. xanthan gum 0.4 gr. 1 ml of glycerin, 3 ml of 96% ethanol, 20 ml of aquabidest which is brownish yellow.

### REFERENCES

- Anonimaa, (2012). *Turmeric morphology*. [Accessed 11 may 2012] <http://id.wikipedia.org/wiki/kumit.com>
- Anonymb.(2012). Classification of turmeric plants. [Accessed 12 May 2012] <http://www.klasifikasikunyit.com>
- Anonymc, (2012). Curcumin chemical structure. [Accessed 12 June 2012] <http://www.kurkumin.chemical.structure.com>
- Anonymd, (2012). Use of metallic paint compounds in hair dye formulas. [Accessed 14 June 2012] <http://www.khasiat.cupri.sulfate.com>
- Barel, AO, Paye, M., and Maibach, HI (2001) Handbook of cosmetic science and technology. New York Basel Pages: 581.
- Bariqina, E., and Ideawati. (2001). Hair Care & Styling. Yogyakarta: Adi Cita Karya Nusa Pages 1-4, 26-27.
- Dalton, JW (1985). The Professional Cosmetologist. St. Paul West Publishing Company Pgs 201-220.
- Indonesian Ministry of Health. (1979). Indonesian Pharmacopoeia. Edition III Jakarta MOH RI. pp 723, 721.
- DG of POM. (1985). Formulanom Cosmetics Indonesia, Jakarta. Department of health. Matter. 86, 206-219.
- Gunawan, D., and Mulyani, S. (2004). Natural Medicine (Pharmacognosy). Jakarta Swadana Spreader. Matter. 139.
- Husna. (2003). Effect of Henna (*Lawsonia inermis* L.) in Jakarta Hair Formulas.
- Putro, D. (1985). To Stay Young. Ungaran Trubus Agriwidya. Matter. 12-15
- Rostamailis. (2008). Hair Beauty. Jakarta: Cable Book. Matter. 15-22 Saati, EA (2006). Make natural color. Print I Surabaya. Trubus Agrisarana Page 30-33.