

# ITCHY LEAVES (*LAPORTEA DECUMANA* (ROXB.) WEDD) SIMPLICIA LOOSE POWDER

Eva S Simaremare \*, Charisma D. N. Putri, Rani D. Pratiwi, Elsy Gunawan

Pharmacy Department, FMIPA Cenderawasih University, Jayapura, Indonesia

\*Corresponding Author's Email: [eva\\_smare@yahoo.com](mailto:eva_smare@yahoo.com)

## ABSTRACT

Itchy leaf [*Laportea decumana* (Roxb.) Wedd] is one of the endemic plants of Papua that has proven as pain and fatigue. This study aimed to formulate an itchy leaf powder and determine the physical quality of the powder then skin irritation test on itchy leaf powder (*L.decumana*). The methods used in this study were collecting the sample, preparing simplicia in three formulas, formulating the powder, testing the physical quality, and testing the skin irritation by the four-hour patch method. The results of the study showed that itchy leaf powder had an FI strength (99.03%), FII (99.0%), FIII (98.47%) with FI moisture (1.21%), FII (1.35%), FIII (1.42%), and pH FI (5.98), FII (6.10), FIII (6.22). This study concluded that itchy leaf powder had a good physical quality and was not irritated to human skin that characterized by the absence of edema and erythema in thirty volunteers.

**Keywords:** *Itchy leaves, Laportea decumana (Roxb.) Wedd; Manokwari; Loose powder; Skin; Analgetics*

## INTRODUCTION

The itchy leaf is one of the endemic plants of Papua used empirically as a medicine for relieving aches and fatigue. Itchy leaf [*Laportea decumana* (Roxb.) Wedd] is one of the plants belonging to the Urticaceae family that spread throughout the world to Indonesia (Perdana *et al.*, 2016; Mom *et al.*, 2016). Itchy leaves have long been used by the people of Maluku, Papua, and Papua New Guinea to treat various health complaints such as pain, stiffness, headache, abdominal pain, muscle, and bruising (Sima rema re *et al.*, 2020; WHO, 2009).

The usage of itchy leaves in society is applied by rubbing the leaves directly on the part body for example stiff, hurt, and painful. To eliminate dizziness in the head, itchy leaves can be used by placing the leaf on the forehead and then can be removed when it felt lighter and better (Rudiyanto, 2015).

Urticaceae family plants generally contain onoridine, tryptophan, histidine, alkaloids, flavonoids, formic acid, and anthraquinone. Moreover in trichomes, these leaves have formic acid and other substances. If the trichomes got into the skin, formic acid was released and affected the widening of the body's pores. Widening these pores stimulates blood circulation to be smoothly relieved the pain, fatigue, and soreness (Sedarnawati & Puro, 2012).

So far, itchy leaves have been developing as ointment and patches (Sima rema re *et al.*, 2015; Simaremare *et al.*, 2018). In the pharmaceutical field, there are several dosage forms used to treat pain in the skin such as powder, cream, gel, or ointment. The researcher is finding the suitable preparation for dermal application pharmacy technology like loose powder. The powder is a cosmetic preparation in the form of a soft, homogeneous fine powder, so it is easily spread or evenly spread on the skin (Rahim *et al.*, 2017). Because the use of itchy leaves is applied topically, the leaves are good to be developed as an anti-oil preparation in the form of powder. So, this study focus to formulate and test the irritation of itchy leaf powder.

## METHODOLOGY

### Collecting simplicia

The collection of plant samples was obtained from the Manokwari area, West Papua. Itchy leaves were collected then dried in an oven with a temperature of 40-50 °C. After completely drying, it was blended to 100 mesh and the refined simplicia was stored in a tightly sealed plastic container.

### Powder formulation

Itchy leaf simplicia and talk were weighed according to the formula determined by the analytical scales, then measured the fragrance volume with a measuring cup according to the formula specified. The three ingredients were mixed until homogeneous and put in a sealed container.

### Physical quality testing of loose powder

#### 1. Organoleptic examination

This test included observations of the form, smell, and color of thirty volunteers. The responses were recorded on each organoleptic test characteristic.

#### 2. Sticky power examination

Powder weighing 100 mg was applied to the surface of the skin with an area of 100 cm<sup>2</sup>. The location of the skin where the powder was applied was blown with a rubber blower. The powder that fell from the surface of the skin was collected in parchment paper then weighed (Voight, 1994). The percentage of falling powder was calculated with the equation:

$$\% \text{ falls powder} = \frac{\text{falls powder}}{\text{powders weight}} \times 100\%$$

#### 3. Moisture test

Total as 5 grams of the powder was weighed accurately, inserted into the porcelain exchange with a diameter of 2-4 cm, then dried in an oven at 105°C until the weight will be constant. The percentage moisture of the powder was calculated by the equation:

$$\% \text{ Massa} = \frac{A}{B} \times 100\% \quad a = A/B \times 100\%$$

A = weight of lost powder mass  
B = weight of powder before dried

(Akelesh *et al.*, 2010)

### pH test

The powder was weighed 10 g and put in a 150 ml beaker glass. Amount 90 ml of water 90 ml was heated to a temperature of 27 °C then cooled and added to the beaker. This mixture was mixed until a good suspension is formed and then determined pH within 5 minutes using a pH meter (Akelesh *et al.*, 2010).

### Skin irritation test

The irritation test was carried out using the human 4-hour patch test method in a closed banned. The covering material consisted of round filter paper with a diameter of 2.5 cm and plaster. The test material was placed on the upper right arm of 30 volunteers for 4 hours. The skin was observed at 0, 24, 48, and 72 hours. Assessment of the degree of irritation was evaluated by assigning a score from 0 to 4 depending on the severity of visible erythema and edema reactions on the skin. Without erythema: 0, very little erythema (diameter <25mm): 1, clear erythema (25,1-30mm): 2, moderate erythema (30,1-35mm): 3, severe erythema (dark red forming eskar, diameter > 35mm): 4. Without edema: 0, very little edema (almost invisible): 1, clear border edema (thickness <1mm): 2, moderate edema (rising edge ± 1mm): 3, severe edema (edge rising > 1mm and extends): 4. During the assessment, the volunteers were allowed to wash the skin of the application site with water, without soap, detergent, and cosmetic products (Pansang *et al.*, 2010).

## RESULTS

**Table 1: Composition of itchy leaves powder formulation**

Material	Composition		
	FI	FII	FIII
Itchy leaf simplicia (g)	10	30	50
Talk (g)	90	70	50
Fragrance (ml)	1	1	1
Add to total(g)	100	100	100

### Physical quality testing of powdered powder



**Figure 1: Itchy leaf powder**

The organoleptic result was shown in Tabel 2. In this study samples of itchy leaf, plants were obtained from Manokwari, Papua. Processing has consisted of sampling part of the leaf, then cleaning it first and drying it using direct sunlight and using the oven at 40-50 ° C then blending to be powder simplicia.

The simplicia that has been made to be powder was tested for its physical quality i.e. organoleptic, adhesive power, powder moisture, pH. This physical quality displayed in Tabel 3 was important because it can affect the quality, safety, and consumer interest in a product.

Organoleptic testing of talcum powder is one of the steps in determining the quality of a talc preparation produced. This examination includes color, odor, texture, and shape that are visually observed.

**Tabel 2: Organoleptic test results itchy leaf powder**

Organoleptic Test	Formula		
	I	II	III
Color	Grey white	Grey	Dark green
Odor	Rose scent	Rose scent	Rose scent
Texture	Smooth and soft	Smooth and soft	rough
Form	Powder	Powder	Powder

Adhesiveness reflected how strong the bond was between the powder and human skin. This study used the skin of the forearm and the skin of the inner upper arm. Good adhesion of powder will make powder easy to apply loose powder and the powder will not be quickly removed due to external factors such as friction (Wilkinson & Moore, 1997). The moisture of the preparation is one of the parameters to determine the physical quality of loose powder (Connor, 1986). The pH value is a value that indicated the degree of acidity of a material (Nurhadi, 2012). According to Wasitaatmadja (2007), a very high or very low pH value can increase the absorption power of the skin, thereby allowing the skin to become irritated (Sameng, 2013). The sticky, moisturizing, and pH were shown in Tabel 3.

**Tabel 3: Adhesiveness, Test Moisture, and pH Results Itchy Leaf Powder**

Formula	Average measurement		
	Adhesiveness power (%)	Moisture (%)	pH
FI	99.03	1.21	5.98
FII	99.00	1.35	6.10
FIII	98.47	1.42	6.22

**Skin Irritation Test**

An irritation test was carried out to determine safety or allergies caused by skin contact with itchy leaf powder. Skin irritation is caused by several factors that play a role such as the condition of the skin surface, the length of time the material is in contact with the skin, and the concentration of the material (Irsan *et al.*, 2013). Talc irritation test was performed on 30 volunteers aged 18-27 years who had normal skin and were tested on the skin of the inner upper arm for 4 hours and then observed at 0, 24, 48, 72 hours (Tabel 4)

**Table 4: Irritation test results**

Test material	Value of Edema	Erythema value	Average value	Irritation test results
FI	0	0	0	Negative
FII	0	0	0	Negative
FIII	0	0	0	Negative

## DISCUSSION

The organoleptic test results showed that the color produced was different between FI, FII, FIII. This was influenced by the number of different itchy leaves for each formula/ Itchy leaf powder has a dark green color and talc has a white color. The more dust it has the greener color of the preparation. The powder on FI, FII, and FIII has the aroma of roses. In the preparation of itchy leaf powder FI, FII has a soft texture, while FIII has a rather rough texture. This is related to the texture of rough itchy leaves and soft talc so the more the amount of itchy leaf powder is used, the more rough the preparation powder will be.

The average fall in powder in the formulation I was the highest and in formulation III was the lowest. This could have been caused by the amount of talc and itchy leaf powder in each formula. In the study conducted by Rahim (2017), the results of adhesion to powder were 67, 61 % to 72.30% and were said to be good with greater stickiness and a lower percentage of powder that fell. With this comparison, FI, FII, FIII preparations of itchy leaf powder can be said to have good adhesion with the percentage of stickiness, respectively: 99.03%, 99.00%, 98.47%.

The results of the average moisture percentage of FI, FII, FIII are 1, 21 %, 1.35%, 1.42%, respectively. These results indicate that the humidity of itchy leaf powder has good moisture following the moisture requirements of the powder according to Akelesh (2010), which is no more than 2%. In Table 4.4 it can be seen that the pH values of itchy leaf powder on FI, FII, and FIII are 5, 98; 6.09; 6.26. According to Wasitaatmadja (1997), the surface of the skin has a certain acidity (pH) that ranges from 4.5 to 6.5, so it can be said that the pH value of itchy leaf powder on FI, FII, and FIII is good and by the pH of human skin.

The irritation test was carried out on 30 volunteers with replication 3 times in each formulation. Positive skin irritation reactions are characterized by a reaction of redness (erythema) and edema in the treated skin area (Irsa n *et al.*, 2013). The irritation test results showed that all volunteers gave a zero value (0) for erythema, ie no / no erythema, and zero value (0) foredema ie no / without edema at 0 hours, 24 hours, 48 hours, and 72 hours. So, the formula for itchy powder does not irritate the skin and is safe to use as a topical preparation.

## CONCLUSION

Based on the research conducted, it can be concluded that itchy leaf powder has FI adhesive power (99, 03%), FII (99.0%), FIII (98.47%). FI humidity (1, 21 %), FII (1.35%), FIII (1.42%). pH FI (5.98), FII (6.10), FIII (6.22), itchy leaf powder has good physical quality. It can also be concluded that itchy leaf powder does not irritate human skin characterized by the absence of edema and erythema in 30 volunteers.

## Conflict of interest

The authors declare that they have no competing interests in writing this article.

## REFERENCES

- Akelesh, T., Kumar, R. S., Jothi, R. P. V. R., Arulraj, P., & Venkatnarayanan, R. (2010). Evaluation of standards of some selected cosmetic preparations. *Asian Journal of Pharmaceutical Research and Health Care*, 2(4), 302-306.
- Irsa n, M.A, Manggav, E, Pakki, & Umar. (2013). Irritation Test Antioxidant Cream Longan Seed Extract (*Euphoria longana* Stend) on Rabbit Skin (*Oryctolagus cuniculus*). *Majalah Farmasi dan Farmakologi*, 17(2), 55-60.
- Mom, S. A, Langi, M. A., Kainde, P., & Nurma wa n, W. (2012). Ethnobotany Study of Itchy Leaf Plants in Mimika District, Cocos, 6(14), 1-4.
- Pansang, S., Maphanta, S., Tuntjarukoen, P., & Viyoch, J. (2010). Skin Irritation Testing Of microemulsion containingessentia l oil isola ted from *Ocinum basilalum*. *Science Asia*, 36(2010), 355-358.

- Minal, S. P., & Prakash, S. (2020). Laboratory analysis of Au-Pd bimetallic nanoparticles synthesized with Citrus limon leaf extract and its efficacy on mosquito larvae and non-target organisms. *Scientific reports*, *10*(1), 21610. <https://doi.org/10.1038/s41598-020-78662-y>
- Riswanto (2013). *Hematology Laboratory Examination*. Yogyakarta: Alfa media .
- Rahim, F., Wardi, E.S., & Anggraini, I. (2017). *Dermatology and Venereology*. Jakarta : Fakultas Kedokteran Universitas Indonesia .
- Rudiyanto, A. (2015). *Laportea decumana* Itchy Leaves for Aches and Pains. Biodiversity Warriors, 1.
- Sedamawati, Y., & Puro, I. (2012). Study of Antibacterial Activity of Itchy Leaves (*Laportea decumana* (Roxb.) Wedd.) and Clove Parasite Leaves. Bogor: IPB.
- Simaremare, E. S., Holle, E., Budi, I. M., & Yabansabra, Y. Y. (2015). ANALISIS PERBANDINGAN EFEKTIFITAS ANTINYERI SALEP DAUN GATAL DARI SIMPLISIA *Laportea decumana* DAN *Laportea* sp. *PHARMACY, Jurnal Farmasi Indonesia*, *12*(01).
- Simaremare, E. S., Holle, E., Gunawan, E., Yabansabra, Y. R., Octavia, F., & Pratiwi, R. D. (2018). Toxicity, antioxidant, analgesic, and anti-inflammatory of ethanol extract of *Laportea aestuans* (Linn.) Chew. *Journal of Chemical and Pharmaceutical Research*, *10*(5), 16-23.
- Simaremare, E. S., Gunawan, E., & Yabansabra, Y. (2020). Evaluation of pharmacological activities of itchy leaf extracts (*Laportea decumana* (Roxb.) Wedd.). *International Journal of Pharmaceutical Research*, *12*(3), 1316-1327.
- Simaremare, E. S., Tolip, M. R. Y., & Pratiwi, R. D. (2022). Formulation and Effectiveness Test of Analgesic Patch from Itchy Leaves (*Laportea decumana* (Roxb.) Wedd.). *CURRENT APPLIED SCIENCE AND TECHNOLOGY*, 13-pages.
- Voight, R. (1994). *Pharmaceutical Technology Textbook*. 5th edition. Yogyakarta: Gadjadara University.
- Wasitaatmadja, S. M. (1997). *Medical Cosmetics Guide*. Jakarta: Universitas.
- WHO (World Health Organization). (2009). *Medicinal Plants in Papua New Guinea*. Manila . World Health Organization, regional office for the Western Pacific.