The Effectiveness of Ketumpang Air (*Peperomia pellucida*) to Reduce the Impact of Edema Using *Smilax* sp.

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Abstract The purpose of this research was to determine the effectiveness of Ketumpang Air (*Peperomia pellucida*) to reduce the impact of edema caused by *Smilax* sp. This research was conducted in the integrated laboratory of the Muhammadiyah Education University (UNIMUDA) Sorong. The variables of this research were Ketumpang Air as the independent variable and the impact of *Smilax* sp. as the dependent variable. The results showed that the giving of Ketumpang air had a significant effect in reducing edema caused by the use of *Smilax* sp. with a significance level of 5% is 0.00089.

Keywords *Peperomia pellucida*, *Smilax* sp., Edema

1. Introduction

Papua has a very complex diversity of living things from flora to fauna [1] which is a combination of the continents of Asia and Australia [2]. One of the biodiversity found in Papua and West Papua is medicinal plants [3]. There are more than 50% of medicinal plants given by Papua land to Indonesia until now and still unknown and a mystery in the Papuan forests [4][5].

Some of the medicinal plants commonly used by people in Papua and West Papua include *Laportea* sp. [6], *Piper methysticum* L [7], *Phaleria macrocarpa* [8], *Myrmecodiatu berosa* Jack. /Rubiaceae [9], *Piper crocatum* Ruiz & Pav./Piperaceae [10] and *Smilax* sp. [11] and Sirih China/Ketumpang Air (*Peperomia pellucida*)[12].

Ketumpang Air or Sirih China also Latin named *Peperomia pellucida* is a plant with a height of 6-45 cm with an upright base stem, but sometimes striated, epiphytic (plants that can grow with other plants, without taking nutrients from the plants they are on). The leaves are of equal length with a width of about 0.3-4 cm, petiole round with longitudinal furrows about 0.1-0.7 cm long, fleshy, oval, triangular, leaves wide at the base and conical at the ends

with a whole edge, 3-5 leaf veins from the base of the flower grow vertically upwards in the opposite direction to the growth of the leaves, with a length of about 0.8-9.2 cm (Mohd Zamri et al. 2020), and live in humid areas [13]

Extracts of this medicinal plant contain various chemical constituents such as alkaloid, flavonoid, saponin, tannin, dan triterpenoid [14]. The various benefits of this plant include treating diseases such as burns and hits, kidney disease, headaches, and fever [15]. In addition, this Ketumpang Air/Sirih China also contains antihyperglycemic [16], which can reduce glucose and uric acid levels [17], while the gel from this plant can heal burns [18] and has antibacterial inhibiting development *Aeromonas hydrophila*, *Edwardsiella tarda*, *Escherichia coli*, 13 *Flavobacterium* sp., *Klebsiella* sp., *Pseudomonas aeruginosa*, *Salmonella* sp., *Vibrio alginolyticus*, *Vibrio cholera*, *Vibrio parahaemolyticus* [19].

Smilax sp. is one of the medicinal plants from Papua, both Papua and West Papua. This plant is usually used as a traditional medicine to enlarge the male genitalia which previously experienced edema/swelling [20]. This edema can occur due to enlarged pores, fluid in the subcutaneous tissue [11].

Based on the description above, we are interested in conducting a research entitled the effectiveness of Ketumpang Air (*Peperomia pellucida*) to reduce the impact of edema using *Smilax* sp. However, in use, if you don't follow proper procedures, you will get serious injuries and have to get hospitalized [21].

Edema is swelling of the tissue due to increased fluid content [22]. This can occur due to excess fluid contained in certain body tissues [23]. Associated with the use of *Smilax* sp., this swelling occurs in the skin pores and triggers an increase in hair follicles [11]. *Smilax* sp. or often called by the people of Papua, this leaf wrap or leaf of three fingers contains vitamin, mineral, amino acid and sulfuric acid, and polyphenol [21]

Traditional medicines are medicines that are obtained

from generation to generation by oral tradition and can be obtained in the wild [24]. Meanwhile, according to the Ministry of Health of the Republic of Indonesia, it is a mixture of ingredients in the form of plant materials, animal ingredients, mineral materials, sarian (galenic) preparations, or mixtures of these materials which have been used for generations for treatment, and can be applied according to the norms prevailing in society. [25].

This is very important to do to determine the effectiveness of *Peperomia pellucida* in reducing edema caused by *Smilax* sp. because many Papuan people use *Smilax* sp. to enlarge their genitals, many of which die due to rupture of blood vessels in their genitals.

2. Materials and Methods

The type of research conducted is experimental research. Experimental research is research that aims to find cause and effect [26]. The application of this research uses *Femus galusgalus* (broilers) as the research object. The design framework for this research is as follows:

Figure 1. Design Framework Research

The population of this research is a traditional medicine with the sample is *Peperomia pellucida*, *Smilax* sp., and *Femus galusgalus*. The techniques and instruments of this research are observation and documentation. The tools used are analytical balance, caliper, and camera. Some of the materials used in this research are *Peperomia pellucida*, *Smilax* sp., and *Femus galusgalus*.

3. Discussion

Based on normality test of thigh size data on *Femus galusgalus* shows that based on the formulation of Kolmogorov-Smirnova for the diameter has a significant value on the use of *Peperomia pellucida* and *Smilax* sp. of

0.200, while the calculation with Shapiro-Wilk the use of *Peperomia pellucida* of 0.303 and on the use of *Smilax* sp. of 0.112. This shows that the results of the data distribution are normally distributed.

Comparison of the thigh size of *Femus galusgalus* (Fgg) before and after the use of *Smilax* sp., after being treated with 10 grams of *Smilax* sp., and for 24 hours, as follows:

Table 1. Size of Thighs Fgg before and after use of *Smilax* sp.

Sample	Diameter of Thighs Fgg Before giving <i>Smilax</i> sp.	Diameter of Thighs Fgg after giving <i>Smilax</i> sp
A1	2,4	3,01
A2	2,5	3,2
A3	2,66	3,2
A4	2,05	2,6
A5	2,49	3,12
A6	2,29	3,08
A7	2,11	2,87
A8	2,12	2,5
A9	2,44	3,2
A10	2,41	3,19
A11	2,2	2,8
A12	2,63	3,1
A13	2,1	2,7
A14	2,51	2,8
A15	2,45	2,9
Mean	2,36	2,95

Graph of average increase/mean size of thigh Fgg when using *Smilax* sp. as stated in the following graph:

Figure 2. Mean size of thigh Fgg using Smilax sp.

Data on the effect of using Ketumpang Air on edema caused by smilax sp., with doses of 10 g, 20 g, 30 g, 40 g, and 50 g, each treatment 3 times. Right thigh as control left thigh as an experiment.

Table 2. The effect of using Ketumpang Air on edema caused by Smilax sp

Sample	Dose (g)	Thigh Diameter Fgg which has Edema due to Smilax sp.	Thigh Diameter Fgg Decreased Edema due to Ketumpang Air
A1	10	2,6	2,56
A2	10	3,14	3,08
A3	10	3,17	3,01
A4	20	2,75	2,11
A5	20	2,6	2,57
A6	20	2,84	2,46
A7	30	2,73	2,13
A8	30	2,46	2,2
A9	30	2,9	2,7
A10	40	3,01	2,55
A11	40	3,09	2,46
A12	40	3,15	2,92

A13	50	2,77	2,13
A14	50	2,59	2,56
A15	50	2,78	2,77
Mean		2,838667	2,547333

Based on the data above, the dose effectiveness of using Ketumpang Air is shown in the following graph:

Figure 3. Graph of the Effectiveness of using Smilax sp. Dosage

Based on the graph, the most effective dose is 20 g with 23% increase in edema percentage.

Size comparison before used of Smilax sp. and after use of Ketumpang Air as described in the following Table 3:

Table 3. Size comparison before use of Smilax sp. and after use of Ketumpang Air on Fgg

Sample	Before being given smilax sp.	After being given Ketumpang Air	The Difference Between Given smilax sp. and After Given Ketumpang Air
A1	2,4	2,56	6%
A2	2,5	3,08	19%
A3	2,66	3,01	12%
A4	2,05	2,11	3%
A5	2,49	2,57	3%
A6	2,29	2,46	7%
A7	2,11	2,13	1%
A8	2,12	2,2	4%
A9	2,44	2,7	10%
A10	2,41	2,55	5%

A11	2,2	2,46	11%
A12	2,63	2,92	10%
A13	2,1	2,13	1%
A14	2,51	2,56	2%
A15	2,45	2,77	12%
Mean	2,36	2,55	7%

Based on these data, it was proven that there was a decrease in the size of the Fgg thighs after being given water by 7%, from the initial impact due to the use of Smilax sp. which resulted in swelling of 23% (in Figure 3).

It is also in line with the results of the hypothesis test using Anova which shows that Ketumpang Air is effective in reducing edema caused by Smilax sp., with a significant level of 5% and a significance level of 0.00089, as illustrated in the following Table 4:

Table 4. ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0,443456	0,443456	18,30617	0,00089826
Residual	13	0,314917	0,024224		
Total	14	0,758373			

This is also supported by a simple regression test, where variable X (Ketumpang Air) affects variable Y (edema caused by Smilax sp.), as described in the following Table 5:

Table 5. P-value Intercept and Ketumpang Air (X)

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	1,510392	0,33917	4,453201	0,000651
Ketumpang Air (X)	0,565666	0,132209	4,278571	0,000898

In the table above, it shows that by using a significance

level of 5%, the existing sample concludes that there is a significant effect between the intercept value on reducing edema, which is indicated by a P-value of 0.000651. Then Ketumpang Air (X) has a significant effect on edema caused by smilax as shown by the p-value value of 0.000898.

Based on the statistical regression test, the R-Square value is 0.584746, which means that Ketumpang Air affects the decrease in edema by 58.47% and the rest is influenced by other variables. These results are illustrated in the following summary of the regression statistical tests:

Table 6. Regression Statistics

Multiple R	0,764687
R Square	0,584746
Adjusted R Square	0,552804
Standard Error	0,155642
Observations	15

The chemical content of Ketumpang Air consists of several anti-inflammatory compounds that function to reduce edema. The chemical constituents are alkaloids, flavonoids, saponins, tannins, and triterpenoids [27][28] [16] and polyphenols [29] which also function as antioxidants. Antioxidants are compounds that can prevent oxidation reactions by donating electrons to free radical molecules so that they can stop chain reactions caused by free radicals [29]

4. Conclusion

Based on the results of this research, it can be ascertained that Ketumpang Air is effective in reducing edema caused by Smilax sp. with a significance level of 5% is 0.00089. A simple regression test shows that by using a significance level of 5%, there is a significant effect between the intercept value on reducing edema, which is indicated by a p-value of 0.000651. Then the Ketumpang Air has a significant effect on edema caused by Smilax sp. as indicated by the p-value value of 0.000898, while the R-Square value is 0.584746 which means that the Ketumpang Air affects the decrease in edema by 58.47% and the rest is influenced by other variables.

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