

# Analysis of Differences in The Use of Fragrant Pandanus Leaf Extract (*Pandanus Amaryllifolius*) and Without Using Fragrant Pandanus Leaf Extract (*Pandanus Amaryllifolius*) as a House Fly Repellent (*Musca Domestica*)

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## ABSTRACT

Background: Fly-borne diseases include dysentery, cholera, abdominal typhus, diarrhea, and others related to poor environmental sanitation conditions, so it is necessary to control flies carefully to avoid environmental pollution and health problems. One plant that contains botanical insecticides is the fragrant pandanus leaf (*Pandanus amaryllifolius*). Fragrant pandanus leaves contain insecticides in the form of alkaloids, saponins, flavonoids, tannins, and polyphenols. The type of research conducted is experimental with a static group comparison experiment design, which simultaneously measures the dependent variable and the independent variable by comparing the treated results with the control results. The research sample amounted to 240 flies. In the 10-minute observation period, 20 flies were released in one cage for each treatment. The results of this study were obtained. There is a difference in the use of fragrant pandanus leaf extract with a dose of 5 ml (7.67), 10 ml (12.33), and 15 ml (13.67) and without using a dose of fragrant pandanus leaf extract on the level of house fly expulsion: 5 ml (2.33), 10 ml (1.67), and 15 ml (1.33). The dose that causes the most significant expulsion of houseflies is in the extract of fragrant pandanus leaves with a dose of 15 ml because the higher the dose, the more flies are expelled. Conclusion: The results of the ANOVA test based on the dose of fragrant pandanus leaf extract on the number of houses flies that do not land, the degree of freedom obtained from 3 to 8, are used to see Ft. It turns out that  $F_{t 1\%} = 7.59$ ,  $F_{t 5\%} = 3.86$ , and  $F_o = 536.32$ ; thus, if  $F_o$  is greater than  $F_t$ ,  $H_o$  is rejected, meaning that there is a significant difference between the various doses of fragrant pandanus leaf extract on the repulsion of house flies.

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## Introduction

Fly-borne diseases include dysentery, cholera, abdominal typhus, diarrhea, and others associated with poor environmental sanitation conditions. The transmission of these diseases occurs mechanically, where the dirty skin of the body and the legs of the flies are the places where the microorganisms of the disease are attached, and then the flies land on the food. Because of the massive spread of diseases that can be transmitted through flies, it is necessary to control flies carefully. There are many types of flies, but the most harmful to humans are house flies (*Musca domestica*), green flies (*Lucilia critical*), blue flies (*Calliphora vomitoria*), and latrine flies (*Fannia canicularis*) (Permenkes RI.

2017).

According to Sucipto (2012), Muscidae flies can carry the eggs of *Oxyrus vermicular*, *Tricharis trichiura*, and *Ascaris lumbricoides*. The hosts of these worms are humans and livestock. WHO data from 2016 states that over 2 billion people worldwide are infected with the parasitic worms *A. lumbricoides*, *T. trichiura*, and *Ancylostoma duodenal*. These are parasitic worms that attack the intestines of humans and livestock. One plant that contains botanical (natural) insecticides to avoid environmental pollution is pandan wangi leaves (*Pandanus amaryllifolius*). Fragrant pandan leaves contain insecticidal alkaloids, saponins, flavonoids, tannins, and polyphenols (Dalimartha, 2009).

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According to Utari (2017), flies and insects generally dislike fragrances such as cloves, fragrant pandan leaves, and lavender. To avoid the breadth of the problem, the authors limit the scope of the study, namely only on the different doses of fragrant pandanus leaf extract (*Pandanus amaryllifolius*) used, namely at doses of 5 ml, 10 ml and 15 ml of fragrant pandanus leaf extract (*Pandanus amaryllifolius*) to repel houseflies (*Musca domestica*). This study aims to determine the difference between using fragrant pandanus leaf extract (*Pandanus amaryllifolius*) and not using fragrant pandanus leaf extract against the expulsion of house flies (*Musca domestica*)

### Research Method

The type of research conducted is experimental with a static group comparison experiment design, simultaneously measuring the dependent and independent variables by comparing the treatment results using a dose with those without a dose. The dependent variable in this study is the level of housefly repulsion by using a dose of 5 ml, 10 ml, or 15 ml and without using a dose and looking at temperature, humidity, and time, while the independent variable is pandan leaf extract, which uses a dose and does not use a dose with three repetitions in each experiment. Doses were made of 5 ml, 10 ml, and 15 ml, with fly samples of each dose of 20 flies, while the control group did not use a dose of 20 flies. The total number of research samples amounted to 240 flies, aiming to determine the difference in fragrant pandanus leaf extract (*Pandanus amaryllifolius*) using and without doses in repelling house flies (*Musca domestica*).

### Results and Discussion

Based on research that has been carried out at home in Lamdingin Village, Kuta Alam Subdistrict, with a total sample of 240 flies, the results of the research obtained from the effectiveness of fragrant pandanus leaf extract (*Pandanus amaryllifolius*) as a house fly repellent (*Musca domestica*) are as follows:

**Table 1** Average Distribution of House Fly Repellency with Pandan Wangi Leaf Extract Using The 5 ml Dose and Those Without Who Did Not Use Fragrant Pandanus Leaf Extract

Pandan Wangi Leaf Extract	Mean	SD	SE	P Value	N
use the dose	7,67	0,577	0,333	0,000	3
without dose	2,33	0,577	0,333		3

Source of data: Primary data (processed in 2021).

The average number of tails expelled by house flies using a 5 ml aromatic pandanus leaf extract dose is 7.67, with a standard deviation of 0.577. The average number of tails expelled by house flies that do not use a 5 ml aromatic pandanus leaf extract

dose is 2.33, with a standard deviation of 0.577. If the p-Levene test p-value is less than alpha (0.05), the variance is different; if the p-value is greater than alpha (0.05), the variance is the same (equal). The p-value = 0.000 in the Independent T statistical test above indicates a significant difference at the significance level at alpha 5%.

**Table 2** Average Distribution of House Fly Repellency with Pandan Wangi Leaf Extract Using The 10 ml Dose and Who Did Not Use Fragrant Pandanus Leaf Extract

Pandan Wangi Leaf Extract	Mean	SD	SE	P Value	N
use the dose	12,33	0,577	0,333	0,000	3
without dose	1,67	0,577	0,333		3

Source of data: Primary data (processed in 2021).

The average number of tails expelled by houseflies using a dose of 10 ml aromatic pandanus leaf extract is 12.33, with a standard deviation of 0.333. Houseflies that do not receive a dose of 10 ml fragrant pandanus leaf extract expel 1.67 tails, with a standard deviation of 0.333. If the p-Levene test p-value is less than alpha (0.05), the variance is different; if the p-value is greater than alpha (0.05), the variance is the same (equal). The p-value = 0.000 obtained from the Independent T statistical test above indicates that at alpha 5%, there is a significant difference in the level of housefly ejection between the aromatic pandanus leaf extract utilized.

**Table 3** Mean Distribution of House Fly Repellency with Pandan Wangi Leaf Extract With 5 ml Dose and with those Who Did Not Use Fragrant Pandanus Leaf Extract

Pandan Wangi Leaf Extract	Mean	SD	SE	P Value	N
use the dose	13,67	0,577	0,333	0,000	3
without dose	1,33	0,577	0,333		3

Source of data: Primary data (processed in 2021).

The average expulsion of houseflies that use a dose of 15ml fragrant pandanus leaf extract is 13.67 tails with a standard deviation of 0.577. at the same time, the expulsion of houseflies that do not use a dose of 15 ml fragrant pandanus leaf extract is 1.33 tails with a standard deviation of 0.577. If the p Levene test p-value < alpha (0.05), then the variance is different, and if the p-value > greater alpha (0.05), then the variance is the same (equal). From the results of the Independent T statistical test above, the p-value = 0.000 means that at alpha < 5%, it can be concluded that there is a significant difference in the level of housefly

expulsion between the fragrant pandanus leaf extracts that use doses and without doses.

## Discussion

### Mean Difference of 5 ml Dose and No Dose

Based on the results of statistical research on mean differences using the independent T-test in the experiment of 5 ml doses of fragrant pandanus leaf extract and without a dose, it turns out that there is a difference in the dose of 5 ml with no dose on the level of housefly expulsion. The average value of housefly expulsion of 5 ml is compacted 7.67 tails with a standard deviation of 0.577 with a standard error of 0.333 from 3 trials. The results of statistical tests obtained a value of  $p = 0.000$ , and it can be concluded that there is a significant difference between fragrant pandanus leaf extracts that use doses and without doses. In this experiment, the temperature ranged from 320C with 85% humidity to 330C with 84% humidity, so it can be concluded that there is no effect on the experiments carried out because the temperature is within normal limits. Houseflies are alive and active at 350°C and will die at 450°C.

### Mean Difference of 10 ml Dose and No Dose

Based on the results of statistical research on mean differences using the independent T-test in experiments with 10 ml doses of fragrant pandanus leaf extract and no dose, it turns out that there is a difference between doses of 10 ml and no dose on the level of housefly expulsion. The average value of housefly expulsion of 5 ml is compacted 12.33 tails with a standard deviation of 0.577 with a standard error of 0.333 from 3 trials. The results of statistical tests obtained a value of  $p = 0.000$ , and it can be concluded that there is a significant difference between fragrant pandanus leaf extracts that use doses and without doses. In this experiment, the temperature ranged from 320C with a humidity of 85% to 340 with a humidity of 86.5%, so it can be concluded that there is no effect on the experiments carried out because the temperature is within normal limits. Houseflies are alive and active at 350 C and will die at 450 C.

### Mean Difference of 15 ml Dose and No Dose

Based on the results of statistical research on mean differences using the independent T-test in the experiment of 15 ml doses of fragrant pandanus leaf extract and no dose, it turns out that there is a difference in the dose of 15 ml with no dose on the level of housefly expulsion. The average value of housefly expulsion of 5 ml solidified 13.67 tails with a standard deviation of 0.577 with a standard error of 0.333 from 3 trials. In this experiment, the temperature ranged from 320C with 85% humidity to 330C with 84% humidity, so it can be concluded that there is no effect on the experiments conducted because the temperature is within normal limits. Houseflies are alive and active at 350 C and will die at 450 C.

So it can be concluded that in this study, there was no effect of temperature and humidity on the expulsion of houseflies because houseflies live and are active at temperatures below 350 and will die at a temperature of 450 C, as stated by (Permenkes RI. 2017). The results of this study follow those studied by Utari (2017): flies and insects generally do not like fragrances such as Cloves, Fragrant Pandan leaves, and Lavender. According to Dalimartha (2018), fragrant pandan leaves contain chemical substances alkaloids, saponins, flavonoids, tannins, polyphenols, and dyes.

The results of this study indicate that the higher the dose of fragrant pandanus leaf extract (*Pandanus amaryllifolius*), the more visible the expulsion of houseflies (*Musca domestica*). It is because the bait is sprayed with fragrant pandanus leaf extract (*Pandanus amaryllifolius*) mixed with 1 liter of water. Due to the fragrant pandanus leaf extract (*Pandanus amaryllifolius*) contains insecticides in the form of saponins, polyphenols, flavonoids, essential oils, and alkaloids, this chemical content produces bitter compounds so that it gives off an aroma that flies do not like. Dalimartha, (2018).

## Conclusions and Suggestions

### Conclusion

Based on the results of research and discussion on the expulsion of house flies (*Musca domestica*) with fragrant pandanus leaf extract (*Pandanus amaryllifolius*), the following conclusions can be drawn:

1. There is a difference in the use of fragrant pandanus leaf extract with a dose of 5 ml and without using a dose of fragrant pandanus leaf extract on the level of house fly repulsion. The average number of house flies that use fragrant pandanus leaf extract with a dose of 5 ml is 7.67, and without using a dose of fragrant pandanus leaf extract, that is expelled 2.33.
2. There is a difference in the use of fragrant pandanus leaf extract with a dose of 10 ml and without using a dose of fragrant pandanus leaf extract on the level of house fly repulsion. The average number of house flies that use fragrant pandanus leaf extract with a dose of 10 ml is 12.33; without using a dose of fragrant pandanus leaf extract, that is expelled 1.67.
3. There is a difference in the use of fragrant pandanus leaf extract with a dose of 15 ml and without using a dose of fragrant pandanus leaf extract on the level of house fly repulsion. The average number of house flies that use fragrant pandanus leaf extract with a dose of 15 ml is 13.67, and without using a dose of fragrant pandanus leaf extract that is repelled, 1.33.
4. The dose that causes the greatest expulsion of house flies is in fragrant pandanus leaf extract with a dose of 15ml because the higher the dose, the more flies are expelled.

### Suggestions

1. The results of this study should be used as information for environmentalists to use natural insecticides as a new alternative tool that is environmentally friendly and protected from environmental damage due to the use of artificial insecticides containing chemicals.
2. To get a more practical value in studying fragrant pandanus leaf extract (*Pandanus amaryllifolius*) in house fly repellent (*Musca domestica*). Then it is expected that in further research, add more fragrant pandan leaves with a higher dose so that the results are perfect. Research should be carried out in hot areas (coastal) and cold areas (mountains).
3. To the government, in this case, the officer responsible for environmental sustainability uses natural insecticides such as fragrant pandan leaves because fragrant pandan leaves are one of the new environmentally friendly alternatives without harmful chemicals in repelling houses last.

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