The Effect Of Marigold Root Slices On Mosquito Avoidancein The Community Of Batu Galing Village

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ABSTRACT

The bite of the Aedes aegypti mosquito, which can cause dengue fever, eradicates the vector life cycle, by killing mosquito larvae, using fogging, abate powder, which have an effect on the environment. Researchers looking for natural larvicidal solutions that are safe and effective, researchers saw marigold plants in research sites. Marigold plants contain essential oils that are effective as larvicides in Culex quinquefasciatus mosquitoes, Anopheles stephensi and Aedes aegypti. This is a quasi-experimental study, a cross-sectional study design. The aim was to determine the effect of marigold root slices on the ability to avoid mosquitoes, as a repellent. The research location was in a room where mosquito nets were available, containing 110 mosquitoes. almost all (80%) found 88 evading mosquitoes and the remaining 22 (20%) mosquitoes alighted from a total of 110 mosquitoes in a mosquito net box with 1 gram of marigold root slices in under 5 minutes. The results of the Chi-square analysis obtained a P value = 0.04 <α 0.05, statistically there was a significant positive effect between the marigold root slices on the ability to avoid mosquitoes, with an odds ratio = 4.10 times. So that people get used to it, placing marigold root slices in the room to repel mosquitoes.

Keywords: Marigold plant roots, mosquitoes.

INTRODUCTION

Dengue hemorrhagic fever (DHF) in the community is a type of acute infectious disease that is still a health problem for individuals, families and communities. Dengue hemorrhagic fever is an acute viral febrile disease, which is transmitted through the bite of the Aedes aegypti mosquito from a mosquito that transmits dengue virus to the human body through its saliva which enters the bloodstream causing dengue hemorrhagic fever WHO (2021).

Entering the transition period from the dry season to the rainy season, Dengue/DHF cases in Indonesia have been observed to increase. Based on records from the Directorate of Communicable Disease Prevention and Control (P2PM) until Week 36, the cumulative number of confirmed cases of DHF from January 2022 was reported as many as 87,501 cases (IR 31.38/100,000 population) and 816 deaths (CFR 0.93%). “In general, there has been an increase in Dengue cases. Most cases occur in the age group 14-44 years as much as 38.96 percent and 5-14 years as much as 35.61 percent," Director General of Disease Prevention and Control, Ministry of Health RI Jakarta. (2022).

The main strategy for eradicating DHF is eradicating adult mosquitoes through fogging, then the strategy is expanded by using larvicides which are sprinkled into water reservoirs (TPA). Both methods have not shown satisfactory results so far. This is evident from the increase in the number of DHF cases and the number of areas infected with DHF. Ministry of Health of the Republic of Indonesia (2020).

Community behavior expected in Healthy Indonesia 2025 is behavior that is proactive in maintaining and improving health, preventing the risk of disease, protecting oneself from the threat of disease and other health problems, being aware of the law, and actively participating in public health movements, including organizing healthy communities and safe/safe community. Republic of Indonesia Ministry of Health. (2021).

The research results of Aji, et al (2016) Environmental factors and indicators related to dengue vector larvae in Rejang Lebong District.

Cases of dengue hemorrhagic fever (DHF) in Bengkulu Province, from January to August 2022 have reached 828 cases. This condition has prompted the Bengkulu Provincial Government to take anticipatory steps so that the disease caused by the Aedes aegypti mosquito continues to surge. Head of the Disease Control and Eradication (P2P) Division of the Bengkulu Provincial Health Office. (2022)

There were 76 cases of dengue fever that occurred in Rejang Lebong Regency from January to the end of October 2022, of which three people were declared dead," Head of the Rejang Lebong Health Service (2022).

The results of previous research by Marini, (2018) The results of phytochemical tests using the color test method on marigold leaf

extract succeeded in identifying alkaloids, flavonoids, saponins, and tannins. The results of the protective power test showed that marigold leaf extract lotion was not effective as a repellent against Ae. aegypti with a protective power above 90% only lasted for two hours after application, namely at a concentration of 30%.

The results of Aji's research (2017) show that there is a significant effect of citronella on the presence of Aeges aegypti larvae in water reservoirs.

Research results by Suharno Zen, (2020): Based on research data there is a very significant effect on mortality resulting from each given extraction concentration. Based on research at a concentration of 2% resulted in the highest mortality effect of Aedes sp. that is, with an average of 92.5% with the number of deaths of 37 out of 40 mosquitoes. Kotok (T. erecta) leaf extract can be used as an alternative in controlling Aedes sp. mosquitoes. Conclusion: The research results can be used as a learning resource in the form of modules and are feasible to use with a validation result of 85.2%.

The results of Aji's research (2015) show that there is an influence on the role of jumantik performance on the incidence of dengue hemorrhagic fever in Rejang Lebong Regency.

The novelty in this study was to find out the side effects of soaking the aroma of sliced leaves, bark, flower buds, flowers, and roots of the marigold plant, on the repelling power of mosquit

The survey, which was conducted by researchers on Saturday 11 February 2023, saw that marigold plants seem to be growing on the side of the road or in the yards of residents of the Batu Galing Village community, but the community does not yet know the benefits and effects of marigold plants as mosquito repellents.

The role of the community in eradicating dengue hemorrhagic fever mosquito nests at the research location has not been fully realized optimally, because mosquitoes are still found, the community's habits when mosquitoes appear in the rainy season, the behavior of community members to kill mosquitoes by using sprays, mosquito coils, mosquito rackets, and avoid being bitten by mosquitoes using mosquito nets, mosquito nets, etc., but mosquitoes are still there.

Based on the background above and considering that the highest number of suspected cases of dengue hemorrhagic fever were at the study site, the authors were interested in conducting research: The Effect of Marigold Root Slices on Mosquito Avoidance, in the Batu Galing Village Community.

RESEARCH PURPOSES

This study aims to determine the positive effect of the aroma of sliced marigold root on mosquito repelling power

METHOD

This type of research is quasi-experimental, cross-sectional study design, namely research that is close to a real experiment, to determine the positive effect of the aroma of sliced marigold root on the ability to avoid mosquitoes as a repellent to repel mosquitoes. The dependent variable is the number of mosquitoes that avoid and alight on the aroma of sliced marigold root The independent variable, namely the administration of Marigold Root slices, was analyzed using a 2 x 2 cross tabulation, calculating the odds ratio, and the Chi square test. The research object sample is 110 mosquitoes in a mosquito net box. Research implementation 3 (three months.

The analysis used was univariate to determine the positive effect of the aroma of sliced Marigold Root on the Aversion Power of Mosquitoes as a mosquito repellent and the proportion of each of the variables studied. Bivariate analysis was to determine the positive effects of the independent and dependent.

RESEARCH TOOLS AND MATERIALS

Researchers used the following tools: knife, water, glass, scissors, bowl, mosquito net, mosquito netting box, stopwatch, clock, stationery and observation paper,

Researchers used several research materials as follows: leaves, bark, flower buds, flowers, and roots of the marigold plant.

WAYS OF WORKING

The process for making soaking sliced roots, bark, flower buds, flowers, and roots of marigold plants, as follows:

1. Prepare 1 glass of starfruit or as much as 200 ml of water.
2. Take 1 gram of marigold leaves. washed and then sliced.
3. Pieces of sliced marigold roots, put into a bowl, each containing 1 gram of marigold leaves, then processed so that the aroma is in the water soaking the sliced marigold roots.
4. Next, the water soaking the marigold root slices is placed in a bowl and put in a mosquito netting box.

The workings of taking mosquitoes, as follows:

1. Mosquitoes were taken using a mosquito net, the normal ones (wings and legs) were selected, totaling 110 mosquitoes.
2. Then 110 mosquitoes were put in the mosquito net box.

Implementation of research procedures as follows:

1. Prepare all the equipment and materials needed.
2. Take each bowl containing the soaking water. sliced leaves, bark, flower buds, flowers, and roots of the marigold plant which contains 100 ml of cooled water.
3. Prepare a stopwatch or clock, stationery and observation paper.

4. Then take 110 mosquitoes and put them in the mosquito netting box.
5. Take a stopwatch / clock and observe the effect of the soaking water. sliced leaves, bark, flower buds, flowers, and roots of marigold plants.
6. Then record how many mosquitoes dodged and landed on a bowl containing sliced leaves, stem bark, flower buds, flowers, and roots of the marigold plant,
7. Tabulation of the data obtained is then analyzed according to the statistical method used.
The data obtained from the observation results were first analyzed using a cross-sectional study design, analyzed using 2 x 2 cross-tabulations, knowing the positive effects of soaking water, sliced leaves, stem bark, flower buds, flowers, and roots of marigold plants and calculating the odds ratio , and the Chi squared test. with a significance level of 0.05. Reject Ho if p < (0.05). (Nursalam, 2018).

Research result

Univariate Analysis Results

The activities in this study included counting the number of mosquitoes that avoided and landed on a bowl containing sliced leaves, stem bark, flower buds, flowers, and roots of marigold plants, after treatment. The observation process on 110 mosquitoes for a maximum of 5 minutes, for each mosquito that avoided and perched on a bowl containing 1 gram of marigold root slices, the results were obtained as shown in the following table:
The Effect of Marigold Root Slices on Mosquito Avoidance, in the Batu Galing Village Community.

Table 1. The Effect of Marigold Root Slices on Mosquito Avoidance

The Effect of Marigold Root Slices on Mosquito Repelling Power

The Effect of Sliced Marigold Root	Mosquito Reaction					
	Dodge		arrived		Total	
	n	%	n	%	n	%
Yes	88	80	22	20	110	100
No	0	0	110	100	110	100

Based on Table 1 above, it shows that almost all (80%) found 88 evading mosquitoes and the remaining 22 (20%) mosquitoes perched

from a total of 110 mosquitoes in a mosquito net box with 1 gram of marigold root slices in under 5 minutes.

Table 2. The Effect of Marigold Root Slices on Mosquito Avoidance

The Effect of Marigold Root Slices on Mosquito Repelling Power								
The Effect of Sliced Marigold Root	Mosquito Reaction						OR	p
	Dodge		arrived		Total			
	n	%	n	%	n	%		
Yes	88	80	22	20	110	100	4.10	0,043
No	0	0	110	100	110	100		

Bivariate analysis based on table 2 above, shows that the power of avoidance that causes mosquitoes to evade away with a p value = 0.043, has a positive effect on the aroma of sliced Marigold root, which is statistically significant on the ability to repel mosquitoes at odds ratio = 4.10 times.

Research Discussion

4.4 Discussion of research

Based on the results of observations made on the results of the immersion water trials, Marigold root slices on the repelling power of mosquitoes with the same formulation, causing the number of mosquitoes that dodge and perch to differ within the same time span, the results obtained are as follows:

5 Effects of Marigold Root Slices on Mosquito Repelling Power

Based on Table 1 above, it shows that almost all (80%) found 88 mosquitoes avoided and the remaining 22 (20%) mosquitoes perched from a total of 110 mosquitoes in a mosquito net box with 1 gram of marigold root slices in under 5 minutes.

Agree with the results of Suharno Zein's research (2020) that there is a very real effect on mortality resulting from each given extraction concentration. Based on research at a concentration of 2% resulted in the highest mortality effect of Aedes sp. that is, with an average of 92.5% with the number of deaths of 37 out of 40 mosquitoes. Kotok (T. erecta) leaf extract can be used as an alternative in controlling Aedes sp. mosquitoes. Conclusion: The research results can be used as a learning resource in the form of modules and are feasible to use with a validation result of 85.2%.

In line with the opinion of Marini, et al (2018), the results of the phytochemical test using the color test method on marigold leaf extract succeeded in identifying alkaloids, flavonoids, saponins, and

tannins. The results of the protective power test showed that marigold leaf extract lotion was not effective as a repellent against Ae. aegypti with a protective power above 90% only lasted for two hours after application, namely at a concentration of 30%.

Agreed with the results of Alfiah Nur's research (2022, the results showed that repellent spray had a repulsive power, control (-) of 50.67%, concentration of 2.5% of 68.33%, concentration of 5% of 78.67%, concentration of 10 % was 96% and the control (+) was 100%. The results of the test for protection power showed that the repellent spray containing marigold flower essential oil had the highest activity at a concentration of 10%. Based on the results of statistical analysis, it showed that f count was greater than f table 5% and 1% and the results of the SNK follow-up test (Newman Keuls) showed that the 10% concentration was not significantly different from the control (+). The researchers concluded that the soaking of the marigold root slices, it was found that almost all (80%) found 88 mosquitoes Avoiding and the remaining 22 (20%) mosquitoes perched from a total of 110 mosquitoes in a mosquito net box with 1 gram of marigold root slices in under 5 minutes.

Based on the results of the Chi-square analysis, P = 0.04 < α 0.05, statistically there is a significant effect between marigold root slices on the ability to avoid mosquitoes, with an odds ratio = 4.10 times

Conclusion

1. Marigold plants contain essential oils that are effective as larvicides against Culex quinquefasciatus, Anopheles stephensi and Aedes aegypti mosquitoes.
2. Marinating marigold root slices, it is known that almost all (80%) found 88 mosquitoes Avoiding and the remaining 22 (20%) mosquitoes alight from a total of 110 mosquitoes in a mosquito net box with 1 gram marigold root slices in 1 under 5 minutes.
3. The results of Chi-square analysis obtained P value = 0.04 < α 0.05, statistically there was a significant positive effect between marigold root slices on the ability to avoid mosquitoes, with an odds ratio = 4.10 times.

Suggestion

So that people get used to it, put marigold root slices in the room to repel mosquitoes.

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