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THE EFFECTIVENESS OF MARIGOLD FLOWER STICK POWDER ON MOSQUITO PREVENTION

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Abstract

Aedes aegypti mosquito bites can cause dengue fever, eradicate the vector's life cycle, by killing mosquito larvae, using fogging, abate powder, which has an effect on the environment. Researchers were looking for a natural larvicide solution that was safe and effective. Researchers looked at marigold plants at the research location. Marigold plants contain essential oils that are effective as larvicides on Culex quinquefasciatus, Anopheles stephensi and Aedes aegypti mosquitoes. Quasi-experimental research, cross sectional study design. The aim is to find out: The effect of the effectiveness of marigold flower pistil powder on mosquito repulsion. The research location is in a room where there is a mosquito net box containing 120 mosquitoes, almost all of them (90%) were found. 108 mosquitoes avoided and the remaining 12 (10%) mosquitoes landed from a total of 120 mosquitoes. in a mosquito net box with 2 grams of marigold flower pistil powder in under 10 minutes. The results of the Chi-square analysis obtained a value of P = 0.04 < α 0.05, statistically there is a significant positive effect between marigold flower pistil powder on the ability to avoid mosquitoes, with an odds ratio = 4.10 times. So that people get used to it, put marigold flower pistil powder in the room to repel mosquito

Keywords: Marigold Flower Pistil Powder, Mosquitoes, Aedes Aegypti

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INTRODUCTION

Dengue hemorrhagic fever (DHF) in the community is a type of acute infectious disease which 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, which transmits the 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 are observed to increase. Based on records from the Directorate of Infectious Disease Prevention and Control (P2PM) as of Sunday 36, the cumulative number of confirmed cases of DHF from January 2022 is reported to be 87,501 cases (IR 31.38/100,000 population) and 816 deaths (CFR 0.93%). "In general there is an increase in Dengue cases. "Most cases occurred in the 14-44 year age group as

much as 38.96 percent and 5-14 years as much as 35.61 percent," Director General of Disease Prevention and Control, Indonesian Ministry of Health, Jakarta. (2022).

The main strategy for eradicating dengue fever is to eradicate adult mosquitoes through fumigation, then the strategy is expanded by using larvicide which is sprinkled into water reservoirs (TPA). So far, these two methods have not shown satisfactory results. It is proven that the number of dengue fever cases has increased and the number of areas infected with dengue fever. Ministry of Health of the Republic of Indonesia (2020).

Research results of Aji, et al (2016) Environmental factors and indices related to dengue vector larvae in Rejang Lebong District.Cases of dengue hemorrhagic fever (DBD) in Bengkulu Province, from January to August 2022 have reached 828 cases. This condition has forced the Bengkulu Provincial Government to take anticipatory steps so that the disease caused by the Aedes aegypti mosquito continues to increase. Head of the Disease Control and Eradication Division (P2P) of the Bengkulu Provincial Health Service. (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).

Results of previous research by Marini, (2018) The results of phytochemical tests using the color test method on marigold leaf extract succeeded in identifying alkaloid, flavonoid, saponin and tannin compounds. The results of the protective power test showed that marigold leaf extract lotion was not effective as a repellent against Ae. aegypti with protective power above 90% only lasts for two hours after application, namely at a concentration of 30%.

The results of Aji's research (2017) show that there is a significant influence of citronella on the presence of Aeges aegypti larvae in water reservoirs. Research results from Suharno Zen, (2020): Based on research data, there is a very real influence on mortality resulting from each extraction concentration given. Based on research, a concentration of 2% produces the highest mortality effect of the Aedes sp mosquito. namely with an average of 92.5% with a death toll of 37 out of 40 mosquitoes. Extraction of Tahi Kotok (T. erecta) leaves can be used as an alternative in controlling

Aedes sp mosquitoes. Conclusion: The research results can be used as a learning resource in module form and are suitable for use with validation results of 85.2%.

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

Novelty in this research is to determine the side effects of soaking, leaf powder, stem bark, flower buds, flower petals, flower pistils and marigold plant roots, on mosquito repellent.

A survey conducted by researchers on Saturday 06-July-2024, saw that many marigold plants were seen growing on the side of the road or in the yards of residents of the Batu Galing Village community, but the community did not yet know the benefits and influence of marigold plants as a mosquito repellent.

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, community habits when mosquitoes appear in the rainy season, community behavior in killing mosquitoes using sprays, mosquito coils, mosquito rackets, and Avoid mosquito bites using nets, mosquito nets, etc., but mosquitoes are still there.

Based on the above background and considering that the highest number of suspected cases of dengue hemorrhagic fever were in the research location, the author was interested in conducting research: The effect of the effectiveness of marigold flower pistil powder on mosquito repulsion

RESEARCH PURPOSES

This research aims to determine the effect of the effectiveness of marigold flower pistil powder on mosquito repulsion

METHOD

This research was carried out from February for three months in 2024, with a quasi-experimental type of research, cross sectional study design, a research that is close to a real experiment, to determine the effectiveness of marigold flower pistil powder against mosquitoes, as a mosquito repellent. Variables related to the number of mosquitoes which avoids dang landing on the mosquito net wall. The independent variable, namely the administration of marigold pistil powder, was analyzed using 2 x 2

cross tabulation, calculating the odds ratio, and the Chi Square test. The research object sample was 120 mosquito tails in a mosquito net box.

The analysis used was univariate to determine the effect of the effectiveness of marigold flower pistil powder on the ability to avoid mosquitoes as a mosquito repellent and the proportion of each variable studied. Bivariate analysis to determine the positive effect of the independent and dependent variables**.**

Research Tools And Materials

The researcher used several tools as follows: knife, water, glass, scissors, bowl, mosquito net, mosquito net box, stopwatch, clock, stationery and observation paper. Researchers used several research materials as follows: leaves, stem bark, flower buds, flowers, pistils and roots of marigold plants.

Ways Of Working

The process for making soaked root slices, stem bark, flower buds, flowers, pistils and roots of marigold plants, is as follows:

1. Prepare 1 glass of starfruit or 200 ml of water.
2. Take 2 grams of marigold flower pistils. washed thoroughly then made into powder.
3. Put marigold flower pistil powder into a bowl, each containing 2 grams of marigold flower pistil, then process it so that the marigold flower pistil powder smells.
4. Next, the water soaked in marigold flower pistil powder is placed in a bowl and put in a mosquito net box.

How mosquito collection works is as follows:

1. Mosquitoes were taken using mosquito nets, normal ones (legs present) were selected, totaling 120 mosquitoes.
2. Then 120 mosquitoes were put into the mosquito net box

Implementation of research procedures is as follows:

1. Prepare all the necessary equipment and materials.
2. Take each bowl containing soaking water, 200 ml of leaf powder, stem bark, flower buds, flower petals, flower pistils and marigold plant roots. cooled water.
3. Prepare a stopwatch or clock, writing utensils and observation paper.
4. Then take 120 mosquitoes and put them in the mosquito net box.
5. Take a stopwatch / clock and observe the effect of the soaking water. Leaf powder, stem bark, flower buds, flower petals, flower pistils and roots of the marigold plant.

6. Then note how many mosquitoes avoid and land on the bowl containing the powdered leaves, stem bark, flower buds, flower petals, flower pistils and roots of the marigold plant.
7. Tabulate the data obtained and then analyze it according to the statistical method used.
8. Data obtained from observations were first analyzed using a cross sectional study design, analyzed using 2 x 2 cross tabulation, to determine the positive effect of providing soaking water. powder leaves, stem bark, flower buds, flower petals, flower pistils and roots of marigold plants, and calculate the odds ratio, and Chi square test. with a significance level of 0.05. Reject Ho if p < (0.05). (Nursalam, 2018).

RESEARCH RESULT

Univariate Analysis Results

Activities in this research include calculating the number of mosquitoes that avoid and land on bowls containing powdered leaves, stem bark, flower buds, flower petals, flower pistils and marigold plant roots, after treatment. The process of observing 120 mosquitoes for a maximum of 10 minutes, for each mosquito that avoided and landed on a bowl containing 2 grams of marigold flower pistil powder, the results were obtained as in the following table:

Effect of effectiveness of marigold flower pistil powder on mosquito repulsion

Table 1: Effect of marigold flower pistil powder on mosquito deterrence

The Effect of Marigold Flower Pistil Powder on Mosquito Repellent Power

marigold pistil powder	Mosquito Reaction					
	Dodge		Perch		Total	
	n	%	n	%	n	%
Yes	108	90	12	10	120	100
No	0	0	120	100	120	100

Based on Table 1 above, it shows that almost all (90%) of the 108 mosquitoes found avoided and the remaining 12 (10%) mosquitoes landed from a total of 120 mosquitoes in the mosquito net box with 2 grams of marigold flower pistil powder in under 10 minutes.

Table 2 Effect of marigold flower pistil powder on mosquito deterrence

The Effect of Marigold Flower Pistil Powder on Mosquito Repellent Power

Effect of marigold pistil powder	Mosquito Reaction						OR	p
	Dodge		Perch		Total			
	n	%	n	%	n	%		
Yes	108	90	12	10	120	100	.10	,043
No	0	0	120	100	120	100		

Bivariate analysis based on table 2 above shows that the avoidance force that causes mosquitoes to avoid mosquitoes with a p value = 0.043, has a positive effect on the aroma of marigold flower pistil powder, which is statistically significant on mosquito avoidance power at an odds ratio = 4.10 times.

RESEARCH DISCUSSION

Based on the results of observations made from water immersion trials, marigold flower pistil powder on mosquito deterrence with the same formulation, caused the number of mosquitoes to avoid and land differently in the same time span, the results obtained were as follows: Effects of marigold flower pistil powder on mosquito deterrence

Based on Table 1 above, it shows that almost all (90%) of the 108 mosquitoes found avoided and the remaining 12 (10%) mosquitoes landed from a total of 120 mosquitoes in the mosquito net box with 2 grams of marigold flower pistil powder in under 10 minutes.

According to the research results of Suharno Zein (2020), there is a very real influence on mortality resulting from each extraction concentration given. Based on research, a concentration of 2% produces the highest mortality effect of the Aedes sp mosquito. namely with an average of 92.5% with a death toll of 37 out of 40 mosquitoes. Extraction of Tahi Kotok (T. erecta) leaves can be used as an alternative in controlling Aedes sp mosquitoes. Conclusion: The research results can be used as a learning resource in module form and are suitable for use with validation results of 85.2%.

In line with the opinion of Marini, et al (2018), the results of phytochemical tests using the color test method on marigold leaf extract succeeded in identifying alkaloid, flavonoid, saponin and tannin compounds. The results of the protective power test showed that marigold leaf extract lotion was not effective as a repellent against Ae. aegypti with protective power above 90% only lasts for two hours after application, namely at a concentration of 30%.

Agrees with the research results of Alfiah Nur (2022. The results of the research show that the repellent spray has repellent, control (-) power of 50.67%, 2.5% concentration of 68.33%, 5% concentration of 78.67%, 10% concentration. % was 96% and control (+) was 100%. The results of the protective power test showed that the repellent spray containing marigold flower essential oil had the highest activity at a concentration of 10%. and 1% and the results of the SNK (Newman Keuls) follow-up test showed that the 10% concentration was not significantly different from the control (+).

The researchers concluded that by immersing marigold root slices, it was found that almost all (90%) of the 108 mosquitoes found avoided and the remaining 12 (10%) mosquitoes landed from a total of

120 mosquitoes in the mosquito net box with 2 grams of marigold flower pistil powder in under 10 minutes.

Based on the results of the Chi-square analysis, it was obtained that the value of P = 0.04 < α 0.05, statistically there is a significant effect between marigold flower pistil powder 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. Soaking in marigold flower pistil powder, it is known that soaking in marigold flower pistil powder, it is known that almost all (90%) of the 108 mosquitoes found avoided and the remaining 12 (10%) mosquitoes landed from a total of 120 mosquitoes in the mosquito net box with marigold flower pistil powder 2 grams in under 10 minutes.
3. The results of the Chi-square analysis obtained a value of P = 0.04 < α 0.05, statistically there is a significant positive effect between marigold flower pistil powder on the ability to avoid mosquitoes, with an odds ratio = 4.10 times.

Suggestion

So that people get used to it, put marigold flower pistil powder in the room to repel mosquitoes.

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