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MINIMIZING MOSQUITO POPULATION WITH PURPLE LIGHT OVITRAP FERMENTATION

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ABSTRACT
Mosquitoes have small and light bodies, free to fly in the air making them easy to carry by the wind, at night mosquitoes fly towards the light. The presence of mosquitoes can harm human health, because mosquitoes can transmit several diseases in human life. Researchers interested in controlling the mosquito population need to make an effort to reduce the mosquito population. The purpose of this study was to determine the effectiveness of modified ovitrap with purple light, with modified brown sugar and yeast fermentation bath, in the intervention group and the control group. Survey of mosquito locations as many as 36 bathrooms. Observational research, cross sectional study design. The survey data were analyzed using the chi-square test. The results of the study were that most of the 28 mosquitoes (77.8%) of the 36 mosquitoes were trapped in a purple lamp ovitrap in 50 ml of fermented water within 24 hours. Based on Chi-square analysis, the value of P = 0.004 < 0.05 was obtained. So Ho is rejected and Ha is accepted statistically there is a significant relationship between Mosquito Population Control With Purple Light Ovitrap Fermentation, against mosquitoes trapped in a purple light ovitrap device, with a fermentation bath. red and yeast effective, 4.10 times found the presence of trapped mosquitoes. Mosquito Population Control With Purple Light Ovitrap Fermentation

KEYWORDS: Control, Mosquito, Ovitrap Fermentation, Purple light.

INTRODUCTION

Mosquitoes are accustomed to perch and bite the human body as their target. The effects of mosquito bites are very detrimental to humans, the mildest of which can cause itching and all the effects it causes are also very disturbing to our activities. An even more dangerous consequence of mosquito bites is the outbreak of Dengue Hemorrhagic Fever (DHF) which is transmitted through the bite of the Aedes aegypti mosquito (WHO, 2001).

In 2015 the Incidence Rate (IR) of DHF in Indonesia was 50.75 per 100,000 population with a Case Fatality Rate (CFR) of 0.83% in 2015 which then increased in 2016 to 78.85 per 100,000 population with a CFR. by 0.78%. In 2017 the IR of DHF in Indonesia was 22.55 per 100,000 population with a CFR of 0.75%. (Inila, 2020, Ministry of RI, 2013).

The Aedes aegypti mosquito is a vector mosquito that carries the dengue virus that causes Dengue Hemorrhagic Fever (DHF) which is still a health problem in Indonesia for both health workers and the public (Aji, 2017).

Dengue hemorrhagic fever is one of the diseases that is still a health problem in Indonesia for both health workers and the public, so it can be worrying about contracting dengue fever in the community (Aji, 2017).

The development of mosquitoes becomes a lot during the rainy season and mosquitoes fly into the house and even bite anyone they meet (Aji, 2019).

The mosquito population in the community is quite a lot, this is influenced by the anatomical shape of the mosquito relatively small and able to adapt to various environmental conditions. Aji (2019) The Aedes aegypti mosquito is a vector mosquito that carries the dengue virus, this virus can cause Dengue Hemorrhagic Fever (DHF) (Aji, 2019).

The current distribution of the Aedes aegypti mosquito species is not only found in urban areas (urban) but also found in urban areas in rural areas (Ministry of Health RI, 2017).

The life behavior of mosquitoes that like to fly into the air with a light body weight makes it easy for mosquitoes to be carried by the wind, at night mosquitoes fly towards the direction of lighting (Aji, 2016).

The presence of mosquitoes can harm human health, because mosquitoes can transmit diseases in human life. The mosquito population is getting out of control. Researchers interested in controlling the mosquito population need to make an effort to reduce the mosquito population (Aji, 2017).

The phenomenon when researchers observe the habit of flying mosquitoes at night, some fly near the porch lights of the house when they are.The researcher was interested and got an idea, to do research on: modification of the ovitrap device that the researcher had made from plastic bottles fermented with brown sugar, yeast and water, where the aroma of fermentation can invite the smell of insects and mosquitoes to come. The researcher also got the idea, what if the ovitrap from a plastic bottle is given a purple light, can it invite mosquitoes to approach the purple light? This has to go through trials.

According to this researcher, as a form of novelty in this study, the model of the trap invites mosquitoes with purple lighting, on the model of the ovitrap tool.

purple lamp with modified brown sugar, yeast and water fermentation.

So based on the above phenomenon, the researchers raised the theme of the research title, namely: "Control of Mosquito Populations with Purple Light Ovitrap Fermentation"

Research methods research design
Quasi-experimental design. using observational. Nursalam (2008).

The experiment was carried out using a modified purple light fermented ovitrap, placed in a garden location, for 24 hours, installed from 19.00 WIB to 07.00 WIB, then modified fermented ovitrap as a mosquito trap that had been installed at the park location, viewed and then opened, fermented liquid (a mixture of brown sugar, yeast and water) which is in the ovitrap bottle is poured on gauze or a filter tied above the glass, its function is to filter out trapped mosquitoes, then use a flashlight to illuminate the mosquitoes on the gauze / filter taken using tweezers, and arranged on paper, then counted and recorded and added up, from the number of mosquitoes that died in the ovitrap modified bottle fermentation, while the function of the glass was to accommodate the fermented liquid.

Conceptual framework
Table 1: Posttest only control group design.

Group	Treatment (X)	*Post Test*
K1	Purple light ovitrap	O1
K2	Ovitrap without lights	O2

Description
K1: Experimental Group (group treated with Ovitrap with purple light)
K2: Control Group (Ovitrap group without lamp, no treatment)
O1: Post-test (experimental group)
O2: Post-test (control group)
X: Treatment (Ovitrap with Purple Light).

The researcher will divide the respondents into two groups. Group I is the experimental group which received Ovitrap treatment with Purple Lamp and group II was the control group which did not receive lamp treatment. Then the researchers assessed the effectiveness of the mosquito trap model with purple lighting, on a modified ovitrap plastic bottle, using a visual analogue scale for group I (O1) and group II (O2).

Research hypothesis
The hypotheses in this study include:
1. **Ha:** The model of the trap tool is more effective at inviting mosquitoes with purple light lighting, on the modified ovitrap plastic bottle.
2. **Ha:** Ineffectiveness of the model of the trap tool to invite mosquitoes with purple light lighting, on the modified ovitrap plastic bottle.

Operational definition
The variables in this study are
the effectiveness of the model of the trap attracting mosquitoes with purple lighting, on the modification of ovitrap plastic bottles.

From the formula above, the proportion value is 26%-49%=Almost most of the respondents
obtained in the form of a percentage, which 50% = Half of the respondents
obtained is interpreted and 51%-75% = Most of the respondents
using Arikunto scale (2002): 76%-99% = Almost all respondents
0% = None of the Respondents 100% = All respondents
1%-25% = A small part of the respondents

Univariate analysis
This analysis aims to determine the description of the frequency distribution of each research variable by using a proportion measure. Formula used:

$$P = \frac{F}{N} 100\%$$

Description
P = Proportion/total percentage
F = Number of answer frequencies for each alternative answer
N = Number of respondents

Table 2: Operational definition.

Number	Variabel	Operasional Definition		how to measure	measurement result	Scale
1	Free Ovitrap	Mosquito tool	Trap	Observation of trapped mosquitoes	0 = no mosquitoes. 1= there are mosquitoes	Ratio
2	Bound Lamp lighting	Purple light	Light	the intervention group was given light	0 = no mosquitoes 1= there are mosquitoes	Ratio

Population and Sample

The population of this study was all mosquitoes with samples taken from the population with consecutive sampling technique, as many as 72 mosquitoes were met. Inclusion criteria. In the intervention group the number of samples was 36 mosquitoes and 36 mosquitoes in the control group, one to one. Exclusion criteria: Other insects.

Place and Time of research

The research location is in the Rejang Lebong Regency Working Area. Time from August to December 2021.

RESEARCH RESULT

Univariate analysis

Knowing the average effectiveness of the modified ovitrap model with purple light and purple light, with modified ovitrap plastic bottle with brown sugar and yeast fermentation in the intervention group and the control group.

Table 3 shows the results of the study where most of the 28 mosquitoes (77.8%) of the 36 mosquitoes trapped in the ovitrap lamp were given a purple light and in 50 ml of fermented soaking water within 24 hours.

Table 3. Univariate Analysis

Tabel 3. Analisis univariat.

Number	Variabel Independen	Effectiveness				Total		P	OR	CI (95%)	
		Ordinary ovitrap		Fermented ovitrap						Lower	Upper
		F	%	F	%	F	%				
1	Without lights	20	55.6	8	22.2	28	38.9	0,004	4.37	1.57	12.19
2	Purple light	16	44.4	28	77.8	44	61.1				
Total		36	100	36	100	72	100				

Bivariate analysis

Based on Chi-square analysis, the value of P = 0.004 < 0.05 was obtained. So Ho is rejected and Ha is accepted statistically, there is a statistically significant relationship between the effectiveness of Modification of Ovitrap against mosquitoes trapped in a purple light ovitrap, with a fermentation bath. 4.10 times found trapped mosquitoes.

DISCUSSION

Because the behavior of mosquitoes that like to fly into the air with a light body weight makes them easy to carry by the wind, at night the mosquitoes fly towards the lighting, which has been made by researchers on the ovitrap tool, plastic bottles used for mineral drinks, which the researchers wrap, glued together with staples. and given plastic glue and wrapped in blue plastic, and inside the ovitrap bottle was given blue light lighting, so that the mosquito's eyes were attracted to fly towards the blue light, besides the ovitrap spread a vaporous aroma due to exposure to the heat of the blue light from the plastic bottle and provoked the smell of mosquitoes on the aroma of carbon dioxide (CO_2) generated from the aroma of fermented brown sugar, yeast and water, (Aji, 2020) So that mosquitoes fly into the direction of light and aroma from inside the ovitrap hole which is ready to ensnare mosquitoes.

Rustam Erlina, et al, (2016) the results

that showed differences in the number of Aedes spp eggs contained in each ovitrap media. It was concluded that straw water was more effective as an ovitrap medium than mineral water, pond water, and well water.

Agree with research, Wahidah Asriati, et al (2016) research results; The highest number of mosquito eggs trapped in the ovitrap. found in plain water (control) of 238 eggs.

Agree with research Zubaidah Tien et al (2016), the results of their research, showed differences in the concentration of attractant and color of the ovitrap, giving a significant effect in trapping the Aedes sp mosquito to lay eggs in the ovitrap.

CONCLUSION

In the model of the ovitrap device which is modified by fermenting brown sugar and yeast and the water in the ovitrap bottle is exposed to heat by the light of the lamp, and creates and spreads the vaporized aroma from the plastic bottle and provokes the smell of mosquitoes in the aroma of carbon dioxide (CO2) generated from the aroma of the fermented concoction. brown sugar, yeast and water, so that mosquitoes are attracted to fly into the direction of the purple light, and the aroma from inside the ovitrap hole is ready to ensnare mosquitoes.

Suggestion

The Health Office is expected to be able to socialize to the public about the use of ovitrap as an alternative in controlling the Aedes aegypti mosquito vector, by only using plastic bottles of used mineral water drinks.

Further research needs to be done with a modified fermented ovitrap model based on research locations in urban and rural areas.

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