

DENGUE MOSQUITO CONTROL BY MAKING LEMONGRASS SPRAY IN PEKUTAN VILLAGE

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***ABSTRACT** - Dengue fever cases in Indonesia according to records from the Ministry of Health from January to June 2020 reached 45,387 with 432 deaths. In Kebumen Regency, it has reached 42 cases and is predicted to increase. The intensity of the rainy season becomes a growing and breeding medium for dengue disease vectors, namely Aedes Aegypti mosquitoes. To overcome these problems, a lemongrass spray manufacturing program was formed designed by KKN students from Sunan Kalijaga State Islamic University Yogyakarta. This program aims to educate the public about lemongrass that can be used as a mosquito repellent. Lemongrass itself contains several components, such as geraniol (20-40%), citronellal (25-50%), and citronellol (10-15%) which are active ingredients that are not liked and avoided by mosquitoes. This program uses qualitative methods in the form of observation, interviews, and counseling. Through observation, it is known that the number of mosquitoes and lemongrass plants are easily found in the surrounding environment. Researchers apply observation, interview, and counseling methods to the community because these methods are easily accepted by the community and can be continued in the future.*

Keywords: Lemongrass Spray, Mosquito, Dengue Hemorrhagic Fever

1. INTRODUCTION

Indonesia is a tropical country with high air humidity, causing *Aedes aegypti* mosquitoes to breed easily. *Aedes aegypti* mosquitoes that cause dengue hemorrhagic fever (DHF) are urban endemic diseases that are a public health problem. All regions in Indonesia have a risk of contracting dengue hemorrhagic fever, which is caused by the virus that causes and mosquitoes that transmit it has been widespread in residential areas and in public places. DHF also often occurs in communities with high levels of pollution. The increasing population will certainly also increase the waste disposed of by the community, both household waste, shop waste and industrial waste.

In terms of knowledge of health and environmental hygiene, the people of Karanganyar Hamlet, Pekutan Village, understand enough about health. In terms of the health condition of residents, the people of Karanganyar Hamlet are quite good, because of the location Typography with good weather that is not too hot and not too cold. During the prolonged rainy season and the vast area of rice fields in Karanganyar Hamlet has caused a wide spread of mosquitoes, which worries about the transmission of mosquito-borne diseases.

The *Aedes Aegypti* mosquito is a mosquito that is usually black with white stripes on its body. They are not ordinary mosquitoes. They are the main contagors of dengue hemorrhagic fever which has become a global public health problem. Dengue hemorrhagic fever is a disease that can cause serious symptoms, such as high fever, muscle and joint pain, and various complications that can be life-threatening. This disease affects millions of people every year in various parts of the world, especially in tropical and subtropical regions.

The existence of *aedes aegypti* mosquitoes is widely found in our country, Indonesia, because our country is a tropical region. Based on records from the Ministry of Health from January to June 2022, dengue cases in Indonesia reached 45,387 with 432 deaths. In Kebumen Regency itself, dengue cases broke out in early 2020 (five-year cycle) which at that time reached 42 cases and had the potential to increase.

Aedes Aegypti mosquitoes are the main intermediaries of dengue hemorrhagic fever transmission. They bite an infected person and then transmit the dengue virus to others through their next bite. This virus gets into human blood, causes disease and threatens our health.

To avoid transmission of dengue hemorrhagic fever, preventive measures are essential. This involves removing places around the house that could harbor *Aedes Aegypti* mosquitoes, such as standing water, and using mosquito nets while sleeping in infected areas. In addition, you should use mosquito repellent / mosquito spray / mosquito lotion. Mosquito control is also necessary to reduce the risk of spreading this disease. The use of insecticides, extermination of mosquito nests, and community efforts can help reduce the population of *Aedes Aegypti* mosquitoes.

With an understanding of the relationship between the *Aedes Aegypti* mosquito and dengue hemorrhagic fever, we can work together to protect ourselves and society from this serious disease threat. Proper prevention and control efforts can help reduce the spread of this disease and maintain the health of all of us.

Until now, mosquito control as a vector of disease is generally carried out with the use of synthetic insecticides. This is because the material is considered effective, practical, efficacious, and in terms of economy cheaper, but this needs to be watched out because the continuous use of synthetic insecticides will cause environmental pollution, death of various other living things and cause larvae to become resistant. Seeing the negative impact of the use of synthetic insecticides, alternative materials are needed that are more environmentally friendly but also effective in controlling mosquito populations *Aedes aegypti*. An alternative that can be done is the use of vegetable insecticides. One of them is by utilizing citronella (*Cymbopogon citrates*).

Lemongrass is an annual plant. Long and thin lemongrass leaves are widely cultivated because of their benefits as essential oils. Essential oils of medicinal plants come from the tropics and some subtropics of Asia, Africa, America. This lemongrass plant is also widely found in all hamlets of Pekutan Village. Lemongrass is a staple that is always sought after for kitchen spices. In the process of growing lemongrass is also not so difficult.

Lemongrass plant (*Cymbopogon citrates*) It is believed to repel mosquitoes because it has a content and smell that can repel mosquitoes. This plant contains Citronellol and geraniol, both of which are active ingredients that are not liked and strongly avoided by insects, including mosquitoes so the use of these ingredients is very useful as a mosquito repellent. Citronellol has dehydrating toxic properties resulting in death due to continuous fluid loss.

Therefore, this activity aims to provide education about the use of lemongrass both as a kitchen staple but lemongrass can also be used as a liquid ingredient to repel mosquitoes.

2. METHOD

This research uses a qualitative approach method with the aim of researchers to provide education to the community in Pekutan village, Kebumen. This research was conducted in Karanganyar Hamlet and Kedaleman Hamlet, Pekutan Village, Mirit District, Kebumen Regency in July-August 2023. In this study using qualitative methods in the form of observation, interviews, and counseling. Observation is a data collection technique that has specific characteristics when compared to other techniques (Sugiyono, 2018). Observation is not limited to people, but also other natural objects. Through observation activities, researchers can find out the environmental conditions at the KKN location. The results of observations are known that the large number of mosquitoes and easy to find lemongrass plants in the surrounding environment.

Researchers conducted interviews with health workers who were in the health service poly in Pekutan Village. Interviews were conducted to find out public health data and consult related to lemongrass spray. Counseling is a continuous process of behavior change, where changes are needed not only because of the addition of knowledge, but it is expected that there will be a steady change in both skills and attitudes, thus leading to better, effective and profitable actions (Lucie, 2005). This counseling activity was carried out during the PKK RW meeting. Researchers apply observation, interview, and

counseling methods to the community because these methods are easily accepted by the community and can be continued in the future.

3. DISCUSSION

A. Rationale

Indonesian people use lemongrass plants as a spice for various typical dishes. In addition to being a spice in cooking, lemongrass plants are also widely used as ingredients in herbal medicines. However, not many people know that lemongrass also has other potential uses, namely as an insect repellent, especially as an anti-mosquito. Lemongrass plants can be used as mosquito repellent because of the fragrance produced from the leaves and stems that mosquitoes do not like.

Aedes aegypti mosquitoes breed in places that have high air humidity. Dengue hemorrhagic fever (DHF) is caused by the *Aedes aegypti* mosquito which is a public health problem of urban endemic nature. DHF in Indonesia has a very high risk of infection, which spreads in residential areas and public places. One way to prevent the spread of diseases due to mosquito bites is to break the chain of transmission. Many ways can be done such as by using mosquito nets while sleeping, using mosquito repellent, and getting rid of mosquito breeding sites. The use of synthetic chemicals is also a common way to eradicate such disease vectors (mosquitoes). The use of synthetic chemicals is not very environmentally friendly. Anti-mosquito spray, burn, or smear generally contain insecticides containing certain chemical compounds. For example, the mosquito *Culex* sp. and *Aedes aegypti* were eradicated using insect poison sprays.

Lemongrass contains several components, namely geraniol (20-40%), citronellal (25-50%), and citronellol (10-15%) which can cause aroma, so it can be used as a mosquito repellent. Citronellol and geraniol are active ingredients that are not liked and avoided by insects including mosquitoes, so the use of these ingredients is very useful as a mosquito repellent. Lemongrass is also a repellent, lemongrass oil can also be used in the cosmetic field, namely as the main ingredient of soaps, skin lotions, and perfumes.

In Indonesia, lemongrass plants are very easy to find, because Indonesia is a tropical country that is very easy to grow lemongrass plants. This can certainly produce new sustainable innovations so that the utilization of lemongrass plants can be utilized optimally. With this product, of course, it can increase the economic value of lemongrass plants, which are usually only a spice but can also be used as mosquito repellent sheets.

B. The Urgency of Research on Lemongrass Spray Products

Mosquito repellent sprays from lemongrass can be used as a natural and affordable alternative to protect yourself from mosquito bites. This spray has the advantage that it does not harm the skin because it is made from natural ingredients, contains substances such as methylheptenon, geraniol, and citronellal that can repel mosquitoes, is easy to find and process, and can be used by target communities and has been proven to reduce mosquitoes. By using mosquito repellent sprays from lemongrass, we can avoid excessive use of chemicals that can adversely affect health and the environment. Continuous use of chemicals, in addition to adversely affecting health, will

also make mosquitoes resistant. Therefore, it is necessary to have various alternatives to mosquito repellents derived from plant species such as citronella. In addition, mosquito repellent sprays from lemongrass are also more affordable and easy to process compared to commercial products that are often expensive and contain harmful chemicals. (Virtaningtyas, 2019)

Dengue hemorrhagic fever (DHF) is a disease that is widespread throughout the tropics and parts of the subtropics. This disease caused by the *Aedes aegypti* mosquito is a source of serious concern because of its ability to spread rapidly within an area. Even in one month, endemic areas can record dozens of dengue cases involving individuals infected with the dengue virus (Syamsir, 2018). People in Indonesia are often accustomed to using chemical mosquito repellents available on the market as a method to repel and prevent the development of *Aedes aegypti* mosquitoes. In general, chemical mosquito repellents contain components such as fumigants, DEET, pyrethroids, propoxur, and so on. These ingredients have a significant level of risk because they can cause harmful effects, both locally through skin contact and systemically through oral or respiratory use. The use of mosquito repellents containing chemicals not only has a negative impact on human health, but can also trigger the development of mosquito resistance to these materials. To reduce this negative impact, we can replace it by utilizing natural materials that are around us, such as plants (Aseptianova, 2017)

It is important for the public to understand the use and processing of lemongrass as a safer and more affordable anti-mosquito alternative. Serei contains compounds such as geraniol, methylheptenon, and citronellal that can repel mosquitoes. Therefore, lemongrass can be processed into an effective and environmentally friendly anti-mosquito spray. Counseling activities on making anti-mosquito spray from lemongrass are also carried out to the community to provide innovation and increase their knowledge. In addition to providing benefits as an alternative to mosquitoes, lemongrass planting and processing can also have an impact on social, economic, and health aspects. In the social aspect, lemongrass planting can provide job opportunities for the community and improve their welfare. In the economic aspect, lemongrass processing can be a new business opportunity for the community and improve the regional economy. In the health aspect, the use of lemongrass spray can help reduce mosquito populations and prevent the spread of mosquito-borne diseases. (Baihaki, 2023)

This activity is intended to introduce a new concept, namely the use of lemongrass as the main ingredient in making mosquito repellent spray. This material is very easy to find and the manufacturing process is also very simple. During the counseling, we will start by explaining about dengue fever, identifying the causative factors, and providing solutions to overcome the problem. Our group wants to bring innovation by utilizing natural ingredients that are safe to use. This activity was carried out twice, first to PKK members in Karanganyar Hamlet which was held on August 6, 2023 and second to PKK members in Kedaleman Hamlet on August 13, 2023. We chose mothers as our primary target because their role in managing the household is often more dominant.

When conducting counseling, we took an approach by presenting cases related to dengue fever that occurred in various regions in Indonesia, including Kebumen. Through

these examples, we strive to provide solutions in the form of mosquito repellent innovations that are not only safe, but also environmentally friendly, namely mosquito repellent spray. During the counseling session, we also explained in detail how to make and apply this spray in a room that may be a breeding ground for mosquitoes. This mosquito repellent product is based on lemongrass plant extract containing the substance citronella, which serves as a poison to kill mosquitoes. The steps in making mosquito repellent spray made from lemongrass plants, among others:

- The bark of lemongrass is peeled from the stem and rinsed using clean water to clean the remaining soil from lemongrass. Making mosquito repellent spray from lemongrass can be done in various ways, one of which is in a blender.
- The first lemongrass is dried in the sun first to dry. The goal is that the water content in lemongrass is reduced so that it can maximize the essential oils that can be obtained.
- Lemongrass is cut into small pieces on the stem to facilitate the grinding process using a blender.
- After blending, lemongrass is filtered and placed in bottles. Lemongrass spray ready for use

With reference to the instructions for making mosquito repellent that have been explained, the steps of processing this innovation are quite simple and can be easily followed by PKK members. In addition, lemongrass plants themselves are plants that are easy to find, so there will be no problem in getting the ingredients. The mosquito repellent spray product that we innovate is also safe to use because it is made from natural plant ingredients, without using potentially harmful chemicals to health.

C. CONCLUSION

Socializing the use and processing of lemongrass as an alternative to mosquito repellent is one solution for the people of Karanganyar and Kedaleman Hamlets to prevent Dengue Hemorrhagic Fever. Sprey Serei is considered as an alternative to plant-based insecticides that are more environmentally friendly and effective in controlling the population of *Aedes aegypti* mosquitoes. This activity is very useful to improve the social, economic, and health aspects of the people of Karanganyar and Kedaleman Hamlets. Sprey serei is beneficial for the community because it can be a new business opportunity for the community, improve welfare and most importantly can help reduce mosquito populations and prevent the spread of mosquito-borne diseases.

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