

Lotion of Rind Durian (*Durio Zibethinus Murr*) as Natural Repellent to *Aedes Aegypti* Mosquitoes

Tanendri Arrizqiyani^{1*}, Rudy Hidana² and Fia Fermata Agesti³

^{1,2,3}STIKes Bakti Tunas Husada Tasikmalaya

Tasikmalaya, Indonesia

*tanendriarrizqiyani@stikes-bth.ac.id

Abstract— Objectives: The purpose of this study was to evaluate protective power of rind durian lotion to *Aedes aegypti* mosquitoes by observing for 6 hours. Method : objects in this research were 75 number of *Aedes aegypti* mosquitos. Volunteer were use rind durian lotion and lotion X (positive control) and then put in their arms to the cage for 6 hours. Different of protective power of rind durian lotion and lotion X to *Aedes aegypti* mosquitoes will presentate. Results and Discussion: The results obtained that protective power of rind durian lotion is 97% and lotion X is 99,5%. The content in the rind durian lotion has an effect that is not liked by mosquitoes. It can influense the nerves in mosquitoes so that it can instability and eventually die. Conclusion: rind durian lotion have potential as natural repellent

Keywords: DHF, *Durio zibethinus murr*, *Aedes aegypti*

I. INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is a disease caused by dengue virus which is classified as Arthropod Borne Virus. DHF is transmitted through the bite of *Aedes aegypti*. DHF can occur throughout the year, especially during the rainy season and can affect all age groups. This disease is characterized by sudden high heat accompanied by red spots on the skin. This disease is related to environmental conditions and people's behavior [1].

Dengue Hemorrhagic Fever is a major public health problem throughout the tropics and subtropics. The spread of this disease occurs rapidly with a 30-fold increase in the past 50 years. The World Health Organization (WHO) estimates that 50-100 million cases of infection occur each year and nearly half of the global population at risk of dengue virus is in the Asia-Pacific region [2]. The world health organization (WHO) records Indonesia as the second country with the largest DHF cases among 30 endemic countries and the highest in Southeast Asia [2].

The most common way to avoid mosquitoes is to use repellent [3]. Mosquitoes have the ability to find prey by smelling carbon dioxide, lactic acid and other odors that come from warm and moist skin. Mosquitoes are very sensitive to these chemicals, so they can detect blood which is their food within a distance of 2.5 meters. Repels will manipulate the odor and taste emanating from the skin by blocking the lactic acid receptors on the mosquito antenna so as to prevent mosquitoes from approaching the skin [4].

One example of a plant that is thought to have potential as an anti mosquito is durian (*Durio zibethinus murr*). This fruit is one of the most consumed fruits in Indonesia because it has a delicious taste and distinctive aroma. This research is an effort to utilize local durian peels which are quite abundant around us and tend to only end up as waste [5].

II. MATERIAL AND METHOD

A. Procedure

The stages of this research are the making of durian skin alcohol extract, phytochemical test, making durian skin lotion, anti-mosquito test of durian skin lotion against *Aedes aegypti* mosquito, data analysis.

B. Data Analysis

The data obtained is then presented based on the equation

$$DP = \frac{K-R}{K} \times 100 \%$$

III. RESULTS

TABLE 1. Phytochemical Test Results Durian Extract

Active compound	Colour	Result
Alkaloid	Burky	+
Flavonoid	Yellow	+
Fenol and Tanin	Black	+
Saponin	Yellow troth	+

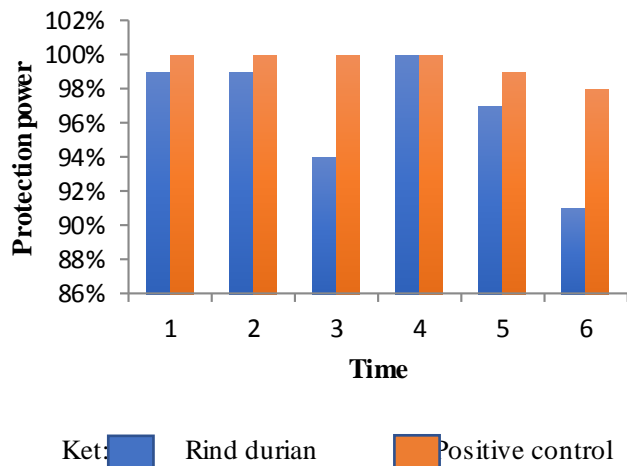


FIGURE 1. Power protection of rind durian at the time

IV. DISCUSSION

Alkaloid testing in the laboratory has shown positive results, with the formation of white deposits when reacted with major reagents [6]. Flavonoids are good reducing compounds, inhibiting many oxidation reactions both enzymes and non-enzymes. These compounds accumulate from the body of plants as toxic substances [7]. Tannin is a type of compound that belongs to the polyphenol group. These tannin compounds are often found in plants. Tannin is one type of compound that belongs to the polyphenol group [7]. Phenols phenol compounds include a variety of compounds derived from plants, which contain one or two hydroxyl groups. Phenolic compounds tend to be in water because generally they often bind to sugar as glycosides and are usually present in cell vacuoles. The Saponin test showed positive results with the color being yellow with foam, after adding a reagent and shaken .. Because Saponin according to [6] is a surface active compound and is like a soap, and can be detected based on its ability to form a stable foam in water and hemolysis of red blood cells.

The results showed durian skin lotion had an average of 97% protection for 6 hours against *Aedes aegypti* mosquitoes. At the first and second hours, the durian skin lotion protection power looks stable and the results are not far from the Control lotion, although at the 3rd hour there is a decrease, but it does not greatly affect the amount of protection. At the 4th hour the protection power starts to rise even the protection power of the Durian Skin Lotion is equal to the protective power of the Positive Control. In the 5th hour and 6th hour, there is a decrease in the protection power again, but it does not greatly affect the amount of protective power. The study began at 09:40 WIB until 15:18 WIB. The observations from the 1st to the 6th hours were up and down of protection, this result was obtained because the mosquito eating habits were not in accordance with the mosquito eating habits. Every mosquito does not suck blood at the same time Female *Aedes aegypti* mosquitoes have the habit of sucking blood in the morning and evening, which is between 08.00 WIB until 12.00 WIB and 15.00 WIB until 17.00 WIB [8].

Based on previous research conducted by Oktavianingrum et al [10], durian skin contains essential oils,

flavonoids, saponins, elements of cellulose, lignin, and starch content. The content in the durian skin has a very pungent odor and is not liked by mosquitoes, because the effect of the content can affect the nerves in mosquitoes and the resulting effect is that mosquitoes experience stability and eventually die.

Rind durian lotion is able to prevent mosquitoes from alighting on human skin, because the durian skin contains active compounds so that mosquitoes do not want to perch, mosquitoes are very sensitive to chemicals and can detect blood within a distance of 2.5 meters [4]. Based on the research of [9] Mosquito repellent topical / lotion is a practical mosquito repellent, easily obtained anywhere and effective for repelling mosquitoes and easy to use anywhere and anytime. In general, people use mosquito repellent lotion / rub when going to sleep so that during sleep they are not bitten by mosquitoes. Because of its practical nature, generally people will carry this type of topical mosquito repellent when traveling. Mosquito repellent lotion (topical mosquito repellent) is felt by the community as a safe mosquito repellent. Public perception about mosquito repellent that is safe, among others, is not too smelly or does not contain harmful chemicals, and or contains a composition of ingredients that are only to repel mosquitoes so that the side effects are more minimal.

V. CONCLUSION

Based on the research that has been done, it can be concluded that the durian skin lotion has protective power with an average of 97% as repellent *Aedes aegypti*.

ACKNOWLEDGMENT

We would like to thank the Research and Community Service Center of STIKes Bakti Tunas Husada for funding this research and publication

REFERENCES

- [1] Kementerian Kesehatan Republik Indonesia. 2016. Riset kesehatan dasar. Jakarta: Badan Penelitian dan Pengembangan Kesehatan
- [2] WHO. 2012. Treatment, prevention and control global strategy for dengue prevention and control. Geneva: WHO Library Cataloguing Data
- [3] Kazembe T, Jere S. 2012. Malaria control with mosquito repelan plants: *Colophospermum mopane*, *Dicoma anomala* and *Lippia javanica*. *Collection of World J Sci and Medical Research*. 2(4):141-9.
- [4] Katz TM, Militer JH Hebert AA.2008. Insect repelans : historical perspectives and new developments. *J Am Acad Dermatol*. 58(5):865-71.
- [5] Fernando,T.,Patricia, A., Yong-seo, P., Soon-teck, J., Seong-gook, K., Bukgu,H., Jerzy,D.,Zofia, Z.,Pawel,Z.,Pawel, P., and Shela, S. 2008, Screening of The Antioxidant and Nutritional Properties,Phenolic Contents and Proteins of Five Duurian Cultivars, *International Journal of Food Sciences and Nutrition*,59(5),415-427.
- [6] Harbone JB. 1987. Metode Fitokimia Penuntut Cara Modern Menganalisa Tumbuhan. ITB: Bandung.1987.
- [7] Robinson, T., 1995, Kandungan Organik Tumbuhan Obat Tinggi, Diterjemahkan oleh Kokasih Padmawinata, 191-193, ITB, Bandung.
- [8] Soegijanto, Soengeng, 2006. Demam Berdarah Dengue. Edisi Kedua. Surabaya: Airlangga Universitas Press.

- [9] Wahyono, T. Y.M., Haryanto B., Sigit Mulyono & Adiwibowo A. 2010. Faktor-faktor yang berhubungan dengan kejadian Demam Berdarah dan Upaya Penanggulangannya di Kecamatan Cimanggis, Depok, Jawa Barat. Jakarta: Buletin Jendela Epidemiologi,2:21-43.
- [10] Oktavianingrum D., 2007. Uji Aktivitas Ekstrak Air kulit Durian (*Durio zibethinus murr*) terhadap Nyamuk *Aedes aegypti*, Skripsi, Fakultas Kedokteran, Universitas Indonesia, Jakarta.