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Test Larvacides of Morizena Bioinsecticides on Aedes aegypti

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Abstract - Dengue Hemorrhagic Fever (DHF) is a disease caused by a mosquito vector *Aedes aegypti* (Linn.). One of the efforts is to reduce the population density by controlling the *Aedes aegypti* mosquito in the larvae stage. One developed alternative control is to use a biological insecticides, using a bioinsecticides made from a mixture of permot leaf extract, chrysanthemum flower seeds, the leaves and stalks of lemongrass (Morizena). This research aims to determine the power of larvacidal insecticide in Morizena bioinsecticides in various concentrations at 250 ppm (P_1), 500 ppm (P_2), 1000 ppm (P_3), 1500 ppm (P_4), 2000 ppm (P_5) and a control group K_0 (without exposure). Larvae mortality was calculated after 24 hour of immersion. The probit analysis used to determine LC_{50} and LC_{90}. Based on the research data shows that Morizena bioinsecticides with 2000 ppm able to kill 100% larvae instar IV of *Aedes aegypti* in 24 hours of immersion. The results of the linear regression equation which shows that the LC_{50} obtained in Morizena bioinsecticides is 710 ppm and LC_{90} is 2040 ppm. Based on the result of this research, the Morizena bioinsecticides with a concentration of 2040 ppm can be used as an effective larvacidal against larvae of *Aedes aegypti*.

1. INTRODUCTION

There are many ways that can be made to prevent or minimize transmission of dengue fever (DHF). One is to break the life cycle of vector using synthetic insecticide bioinsecticide. Measured aimed at the control of mosquito larvae and adult mosquitoes of *Aedes aegypti* [1-2]. Actions aimed at mosquito larvae can modify larvae habitats with insecticides. During this time to control the mosquito vectors of disease is generally done using synthetic insecticides. This is because the synthetic insecticides are effective, practical, efficacious and economically more profitable. But this is necessary because the use of synthetic insecticides continuously will cause environmental pollution, the death of other living creatures and cause pest or larvae become resistant [3].

See losses in the form of side effects caused by synthetic insecticides that it takes an effort to find alternative materials that are more environmentally friendly and effective. Then made Morizena bioinsecticide which is mixture permot leaf extract, chrysanthemum seed flower extract and lemongrass leaf-stem extracs. Chrysanthemum seed flower extract containing pyrethrum and citronella essential oil on has been widely used as a bioinsecticide for mosquitoes, whereas permot leaf extract not been studied benefits.

The problem is how does of Morizena bioinsecticides effective for the control of *Aedes aegypti* larvae and safe for other organisms.

2. METHODS

2.1 Materials and Tools

Morizena bioinsecticide active ingredient is a mixture of permot leaf extract, chrysantemum seed flower extract and lemongrass leaf-stem extract. Moreover prepared 96% ethanol, fish food, clean water or distilled water, *Aedes aegypti* larvae instar IV.

The tools used in this research that the pipette volume, 1000 mL measuring cup, digital scales, plastic trays, 30 plastic cups, glass beaker, gauze, instruments blender, a glass rod, extractor, evaporator, label paper, knives and stopwatch.

2.2 *Aedes aegypti* Larvae Treatment

Aedes aegypti mosquito eggs are hatching eggs are laid in a plastic container of clean water 1 L and wait two days, until the eggs hatch into larvae instar IV. Larvae instar IV from spawning areas transferred to the beaker glass using a pipette. 25 larvae instar IV of the beaker glass transferred into each plastic cup that has been provided and covered with gauze. *Aedes aegypti* larvae have integument is easily damaged so as to toxicity testing is the method used is dipping method [4]. The animals of test targets in the Aedes aegypti larvae acclimation not advance because of rapid changes in larvae stage would complicate the process of observation, but 2-4 hours prior to the study, the larvae were not fed.

2.3 Treatment Group and Analysis Data

Aedes aegypti larvae instar IV were divided into 5 groups with a dose of Morizena bioinsecticide 250 ppm (P_1), 500 ppm (P_2), 1000 ppm (P_3), 1500 ppm (P_4), 2000 ppm (P_5), and a control group without Morizena bioinsecticide treatment (K_0). Replication is performed 4 times on each test material. Data larvae mortality in all groups are taken in minute 15, 30, 45, 60 and 24 hours. Probit test performed to calculate LC_{50} and LC_{95}.

3. RESULTS AND DISCUSSION

3.1 Morizena Toxicity against Aedes aegypti Larvae

Based on the data in Figure 1, is known to have occurred mortality of larvae at doses of 0 ppm (K_0) or as a control group where the solution is not given the extract in smaller amounts (0%, which means that Aedes aegypti larvae instar IV were dead). Figure 1 also shows the percentage increase in the mortality of larvae at each dose level rise Morizena bioinsecticide. This means that if Morizena bioinsecticide dose increases, the mortality of larvae will also increase, whereas in 2000 ppm treatment group (P_5) all *Aedes aegypti* larvae instar IV died at 24 hours observation.

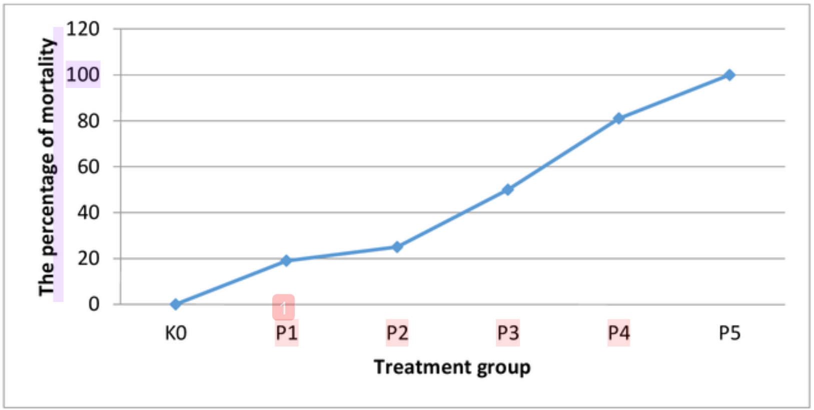

Figure 1 Graph the percentage of mortality of *Aedes aegypti* larvae

The deaths of Aedes aegypti larvae instar IV due to their inability to detoxify toxic substances into the body. The toxicity of the content of secondary metabolites in this bioinsecticide effects on larvae toxicity seen through sub lethal symptoms until the death of the larvae. Observation for symptoms of sub lethal toxicity test this fact, among others, the larvae often come to the surface and the frequency is very old which indicates that the need for oxygen dissolved in water decreases so that the larvae often to the surface to meet the oxygen requirements. Other symptoms are diminished response to stimuli is characterized by aggressiveness when touched. This situation as the active symptoms is caused by the Morizena bioinsecticide bioactive compounds that are toxic.

Toxic compounds contained in Morizena bioinsecticide a foreign substance to the body of larvae. These substances can enter the body through the larvae of some parts of the body, including the wall surface of the body, the respiratory and the digestive tract.

Wall surface of the body is the outermost part of the body that can absorb insecticide larvae in large numbers because this section is directly related to these materials. When larvae took a breath, air and oxygen diffusion into the trachea to help the movement of the abdomen [5]. As well as toxic substances in Morizena bioinsecticide can enter the respiratory system in the form of gas or fine grain brought to the tissue.

In this study of toxic substances into the mouths of the larvae through the respiratory system in the form of spiracles on the surface of the body and cause wilting of the nerves, and damage suffered as a result spiracles larvae cannot breathe and eventually die. The cause wilting of the nerves is pyrethrin compounds in seed extracts of chrysanthemum flowers, harmaline on permot leaf extract, saponine in lemongrass leaf-stem extract, where these compounds can inhibit the action of the enzyme acetyl cholinesterase. Acetylcholine is formed by the central nervous system serves to conduct impulses from nerve cells to muscle cells. Once the impulse is delivered, the process is terminated by the enzyme acetyl cholinesterase, which breaks down acetylcholine to acetyl co-A and choline [5].

At the ends of the nerves of the insect nervous system acetylcholine will be generated if the nerve stimulation or stimulation. This acetylcholine functions as mediator or intermediary, between the nerve and muscle meat so as to allow electrical impulses that stimulate the muscles to contract meat. After a period of contraction is complete, it will be destroyed by the enzyme acetylcholine acetycholineterase into choline, lactate and water. When acetylcholine is not immediately destroyed, the muscles will continue to contract in a long time so it will spasm or convulsions [5].

The presence of the active compounds in Morizena bioinsecticide would hamper the operation of these enzymes resulting in the accumulation of acetylcholine which will cause chaos in the delivery system impulses to muscles which can result in muscle spasms, paralysis and ends in death.

3.2 LC_{50} and LC_{90} of Aedes aegypti Larvae

Results of *Aedes aegypti* larvae instar IV mortality observations on test is used to determine the concentration to be used in further research by using probit analysis. Based on test results of probit analysis, there LC_{50} values obtained at a concentration of 710 ppm and LC_{90} values obtained at a concentration of 2040 ppm.

4. CONCLUSSIONS

Based on the above results, it can be concluded that the Morizena bioinsecticide can be used as biological insecticides to control Aedes aegypti larvae instar IV with an effective dose is 2040 ppm.

5. REFERENCES

1. Borror, D. J., Triplehorn, C. A., Jhonson, N. F. 1996. *Pengenalan Pelajaran Serangga*. Ed. Bahasa Indonesia. Gajah Mada University Press, Yogyakarta.
2. Elena. 2006. *Pengaruh Ekstrak Daun Eupatorium riparium Terhadap Mortalitas dan Perkembangan Larva Nyamuk Aedes aegypti*. *Skripsi*. Jurusan Biologi, Fakultas MIPA, Universitas Diponegoro, Semarang.
3. Metcalf, R.L., Luckmann, W.H. 1982. *Introduction to Insect Pest Management*. John Wiley and Sons, New York.
4. Tarumingkeng, R.C. 1992. *Insektisida Sifat, Mekanisme Kerja dan Dampak Penggunaannya*. Ukrida Press, Jakarta.
5. Suwasono, H. 1997. *Berbagai Cara Pemberantasan Larva Aedes aegypti*. *Cermin Dunia Kedokteran 32*. Jakarta.

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