Turnitin Originality Report

Processed on: 14-Sep-2020 7:34 PM MST
ID: 1387346851
Word Count: 1755
Submitted: 1

The Analysis of Pandanus Leaf (Pandanus Amarylifolius Raxb) as A Plant-Based Pesticides for Adult Phase Fruit Fly (Bactrocera Sp) (Rusmiati Rusmiati, Sri Mardojo) By Heruswn Forikes

Similarity Index	Similarity by Source	
91%	Internet Sources:	N/A
	Publications:	N/A
	Student Papers:	N/A

87% match (Internet from 05-Feb-2020)

http://heanoti.com/index.php/hn/article/download/hn20704/20704

3% match (student papers from 04-Jul-2019)
Submitted to Universitas Jember on 2019-07-04

http://heanoti.com/index.php/hn RESEARCH ARTICLE URL of this article: http://heanoti.com/index.php/hn/article/view/hn20704 The Analysis of Pandanus Leaf (Pandanus Amarylifolius Raxb) as A Plant-Based Pesticides for Adult Phase Fruit Fly (Bactrocera Sp) Rusmiati1 (CA), Sri Mardojo2 1 (CA)Department of Environmental Health, Poltekkes Kemenkes Surabaya, Indonesia; rustig63@gmail.com (Corresponding Author) 2Department of Environmental Health, Poltekkes Kemenkes Surabaya, Indonesia; srimardojo@gmail.com ABSTRACT Fruit flies (Bactrocera Sp) has been known as the main pest to the fruits commodity in Indonesia which caused large economic loss. Pandanus leaf (Pandanus Amarylifolius Raxb) already examined that it was contained some chemical componds that have potential to control pests. The purpose of this research was to analyze the effect of pandanus leaf (Pandanus Amarylifolius Raxb) extract to the mortality of adult phase fruit flies (Bactrocera Sp). The research was done by using laboratory experiment with true experimental post test only controlled group design. The result would be observed only after the animal test exposed by pandanus leaf extraxt with concentration variation was 5%, 10%, 15%, 20%, and 25%. Several test also have done in this research such as photochemistry test, spektrofotometer test, and fruit flies (Bactrocera Sp) mortality. The result showed that pandanus leaf (Pandanus Amarylifolius Raxb) extract contain active compound such as flavonoid, essential oil, tanin, saponin, and alkanoid. Statistic result using anova test showed that p value < 0.05 which mean there were a significant difference of fruit flies mortality in each concentrate of pandanus extract and there were significant influence of pandanus extract to the fruit flies (Bactrocera Sp) mortality. Probit results then, showed that LC50 of pandanus leaf (Pandanus Amarylifolius Raxb) extract to fruit flies (Bactrocera Sp) was 5.216%. Keywords: Fruit flies(Bactrocera sp), Pandanus leaf extract (Pandanus amaryllifolius Roxb.), Insecticide INTRODUCTION Pollution is a main problem in eco friendly development era. Pollution can be caused by the use of chemical pesticide excessively. These happened because farmers want to increase their products by decreasing the number of pest which can destroy agricultural products. Fruit flies (Bactrocera sp) was one of insects that must be controlled in agricultural products. It used to tearing parts of the plant to eat or just

laying eggs. More than 100 plants known as fruit flies targets. In Indonesia there were 66 species of fruit flies which included into Bactrocera genus. These species were more dangerous than Drosophila melanogaste which usually known as fruit flies by society. Endah (2003), Bactrocera sp can lay eggs up to 40 eggs in a day. Indonesia as a tropical country has lots of plants that have been used by human as medicine which called by "herbal medicine". Pandan Wangi or pandanus fragrant leaf (Pandanus amaryllifolius Roxb.) already known as plants which can be used as medicine(1). Pandanus has a special aroma in its leaf. It was come from 2-acetyl-1-pyrroline (ACPY)which also found in jasmine. But ACPY concentration in pandanus leaf is higher than jasmine(2) (Cheetangdee dan Sinee, 2006). Pandanus was used as tonicum, to increase appetite, aromatic, food coloring, and also insecticide because pandanus contain saponin, alkaloida, flavonoida, tanin, polifenol, fenil propanoid, and coloring substance(1). Saponin, tanin, flavonoid, triterpenoid, sulfur, kumarin, and steroid were active chemical compounds that can kill insect (insecticide)(3). Research about the use of pandanus leaf as insecticide already done by Sabrina in 2010(4). The results showed that pandanus has potention to be use as insecticide to Musca Domestica in 17,76% of concentration. Another research about pandanus were done by Li J and Ho S.H (2009), the results showed that pandanus contain phytochemical such as steroid, carbohydrate, fenol, isoflavon, koumestrol, lignans, alkaloid, glikosida, amino acid, and vitamins(5). This research aimed to analyse the effect of pandanus leaf (Pandanus amaryllifoliusRoxb.) extract to the mortality of adult fruit flies (Bactrocera Sp). METHODS In this research there were two research, first was explorative and second was laboratoric. Explorative research was extraction process to pandanus leaf. Laboratory research was the process to test pandanus extract effectivity as insecticide.The laboratoric research used True Eksperimental Post Test Only Controlled Group Design. The variables in these research were pandanus leaf extract with 5%, 10%, 15%, 20%, and 25% of concentration and the mortality of fruit flies. Data will be analysed using probit analysis to find LC50 level. RESULTS Quantitative and qualitative results of chemical compounds which found in Pandanus leaf extract can be seen below. Izzatul (2010), this test was done to make sure that pandanus leaf contain pesticide compounds. Table 1. Chemical Compounds in Pandanus Leaf Extract Compound Flavonoid Essential Oil Tanin Saponin Alkaloid Positive Indicator Red Color Aromatic Blue Green Color Stabilized Foam Red Sediment Results Positive Positive Positive Positive Positive Table 2. Quantitative Compounds in Pandanus Leaf Number 1 2 3 4 5 Compounds Flavonoid Essential Oil Tanin Saponin Alkaloid Percentage 3.01 % 2.05 % 2.11 % 2.68 % 5.11 % Table 3. Fruit Flies Mortality After 1 Hour of Exposure Fruit Flies Number Fruit Flies Mortality in 3 Mortality Averages Mortality Concentration that Use In Test Replications (flies) (flies) Percentages I II III 0% 20 flies 0 0 0 0 0 5% 20 flies 3 4 6 4.3 21.5 10% 20flies 5 7 8 6.7 33.5 15% 20flies 6 8 9 7.7 38.5 20% 20flies 8 9 10 9 45 25% 20flies 9 11 12 10.6 53 From the table 3 we can understand that the increasing of pandanus leaf extract concentration is also involved with the increasing of fruit flies mortality. These data then analysed using one way anova test Tabel 4.One Way Anova Test Results Flies Mortality df Mean Square F Sig. Between Groups Within Groups Total 5 12 17 44.222 1.944 22.743 0.000 Table 5. The Average Difference of Fruit Flies Moratlity in Each Concetration Number 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Pandanus Leaf Extract Concentration 0% - 5 % 0% - 10 % 0% - 15% 0% - 20% 0% - 25% 5% - 10% 5% - 15% 5% - 20% 5% - 25% 10% - 15% 10% - 20% 10% - 25% 15% - 20% 15% - 25% 20% - 25% Significancy 0.003 0.000 0.000 0.000 0.000 0.063 0.013 0.001 0.000 0.397 0.037 0.004 0.169 0.022 0.264 LC50 can be define as the concentration of pandanus leaf extract that can kill 50% of population in a test. In this research the population in a test was fruit flies. LC50 is a results from probit analysis. The results of probit test can be seen below:

Table 6. LC50 (Probit Results) Probability Estimate Lower Bound Upper Bound LC50 5.216 4.698 5.980 DISCUSSION Based on Table 2, alkaloid was the highest compounds which found in pandanus leaf extract(7). Alkaloid was toxic for insect. It can inhibit achetyl cholinesterase enzym and disturb central nerve system and degrade egg cell membrane(8). Based on table 3, it showed that pandanus leaf extract gave effect to the mortality of fruit flies. Each concentration give different percentage to the mortality. of fruit flies. These difference caused by different concentration also mean different level of active compounds which can kill the fruit flies. Dead fruit flies identified by there is no response when it was touched. Based on the result, there is significant effect from Pandanus Leaf extract concentration to the fruit flies mortality. Based on Table 5 we can understand that LSD analysis that significancy in pandanus leaf extract with concentration of 0%-5%, 0%-10%, 0%-15%, 0%-20%, 0%-25%, 5%-20%, 5%-25%, and 10%-25% have p value p< 0.05 which mean it has significant difference while another has p value p >0.005 which mean there is no significant difference. The graphic below showed Fruit Flies response to the Pandanus Leaf Extract. Based on table 6 shows that LC 50 of Pandanus leaf extract to the fruit flies was 5.216% with confidence level 95%. Lower and Upper bound mean LC50 is in range 4.698% until 5.980%. CONCLUSION Pandanus leaf extract (Pandanus amaryllifolius Roxb)has potention to be used as pesticide to control adult fruit flies(Bactrocera,spp)population because it contain active compound alkaloid, tanin, saponin, and flavonoid and essential oil. Based on this research which use Pandanus leaf extract with concentration 5%; 10%; 15%; 20% and25% the LC50 to the fruit flies was 5.216%. Pandanus leaf extract was effective to be used as pesticide. REFERENCES 1. Dalimarta S. Indonesian Medicinal Plants Atlas (Atlas Tumbuhan Obat Indonesia). Jakarta: Trubus Agriwidya; 2009. 2. Cheetangdee V, Siree C. Free Amino Acid and Reducing Sugar Composition of Pandan (Pandanus amaryllifolius) Leaves. Thailand: Departement of Food Science and Technology, Faculty of Agro-Industry, Kasetsart University; 2006. 3. Wuri N, Djoko AB, Dwi RI . Potential Test of Artocarpusaltilis Leaf to Musca Domestica Flies Using Spray Method (Uji Potensi Ekstrak Daun Sukun (Artocarpusaltilis) terhadap Lalat Rumah (Musca domestica) Dengan Metode Semprot). Malang: Universitas Brawijaya; 2013. 4. Sabrina A. Potential Test of (Pandanusamaryllifolius Roxb.) as Insecticide to Musca Domestica (Uji Potensi Dekok Daun Pandan Wangi (Pandanusamaryllifolius Roxb.) Sebagai Insektisida Dengan Metode Racun Perut Terhadap Lalat Rumah (Musca Domestica)). Malang: Fakultas Kedokteran Universitas Brawijaya; 2010. 5. Li J, Ho SH. Pandanus Leaf (Pandanus amaryllifolius Roxb) A Natural Cockroach Repellent. Singapore: Universitas Nasional Singapura; 2009. 6. Izzatul. Effectiveness Test of Fragrant Pandan Leaf Extract (Pandanus amaryllifolius Roxb.) as a Plant Insecticide in Reducing the Number of Flies during the Drying Process of Salted Mackerel (Rastrelliger kanagurta) (Uji Efektivitas Ekstrak Daun Pandan Wangi (Pandanus amaryllifolius Roxb.) sebagai Insektisida Nabati dalam Mengurangi Jumlah Lalat Selama Proses Penjemuran Ikan Kembung (Rastrelliger kanagurta) Asin. Malang: UIN Maulana Malik Ibrahim; 2014. 7. Takayama H, Ichikawa T, Kitajima M, Nonanto MG, Aimi N. Isolation and Structure Elucidation of Two New Alkaloids, Pandamarilactonine-C and –D, from Pandanus amaryllifolius and Revision of Reactive Stereochemistry of Pandamarilactonine-A and -B by Total Synthesis. Chem. Pharm. 2002. 8. Cania AB, Setyaningrum E. The Effecticity of Vitex Trifolia as Larvacide of Aedes Aegypti Larvae (Uji Efektivitas Larvasida Ekstrak Daun Legundi (Vitex Trifolia) terhadap Larva Aedes Aegypti L). Medical Journal of Lampung University; 2013.

Technology 737 | Publisher: Humanistic Network for Science and Technology