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MANUFACTURING VEGETABLE PESTICIDES USING EXTRACTION METHOD FROM PAPAYA LEAVES (*CARICA PAPAYA L.*) AND JARAK PAGAR LEAVES (*JATROPHA CURCAS L.*)

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ABSTRACT
Pesticide made from Papaya leaves (Carica papaya L.), and Jatropha Pagar leaves (Jatropha curcas L.) to control pests. Both of these plants are relatively easy compounds found all around us and contain active that have the potential to be insecticide. Plant extracts are obtained by maceration using a solvent 96% ethanol, then evaporated to separate the extract and solvent so that the extract is obtained. The research variables carried out were the composition P100:J0; P70:J30; P50:J50; P30:J70; and P0:J100. Soaking time 2; 4; 6; 8 days and applied to the pest for 30 minutes. The research results achieved pesticide quality vegetable with pest mortality in the ratio P30:J70 with tannin content 0.0468.

Keywords: Pesticides, Papaya (Carica papaya L.), Jatropha leaves (Jatropha curcas L.), Pest Mortality

INTRODUCTION
One of the problems often faced by farmers is pest attacks, whether in the form of caterpillars, fruit flies or anthracnose. Pest attacks can thwart the harvest, causing huge losses. Pest repellent or pesticides are materials used to control or eradicate pests.

WHO (World Health Organization) notes that every year synthetic pesticide poisoning occurs between 44,000-2,000,000 people in developing countries throughout the world. The use of synthetic pesticides can leave chemical residues on agricultural products and in the soil and even be carried into water sources so that they can poison beneficial organisms and the surrounding environment. Therefore, environmentally friendly alternative pesticides are needed.

As time goes by and technology, an alternative plant pest exterminator has been found, namely biopesticide. Biopesticide is relatively easy to make with simple

technology. The natural raw materials make biopesticides easily decomposed (biodegradable) in nature so they do not pollute the environment and are relatively safe for humans because the residue is easily lost and can replace the role of synthetic pesticides.

Indonesia is an agricultural country that has abundant natural resources, many types of plants or plant parts are known to produce poison for pests. Most plants can be used as alternative pesticides, including papaya leaves and jatropha leaves (Jatropha curcas L.). Both of these plants contain active compounds, have the potential to act as pesticides (pest repellent) and are relatively easy to find around us. Papaya leaves (Carica papaya L.) contain toxic compounds such as alkaloids, flavonoids, tannins, steroids and saponins. Pesticides from papaya leaves are believed to have high effectiveness and specific impacts on pest organisms. The active ingredients of papaya leaves are also harmless to humans and animals. Likewise, Jatropha curcas (Jatropha curcas L.) leaves contain substances
substances in the form of tannins, saponins, flavonoids, alkaloids, terpenoids, steroids and glycose. Apart from being environmentally friendly, natural pesticides are pesticides that are relatively safe to use and economical. So this research needs to be carried out to develop the manufacture of pesticides from natural ingredients.

METHOD

Research Place

This research was carried out at the Oil and Gas Processing Laboratory, Chemical Engineering Department, Lhokseumawe State Polytechnic. The research was conducted on 15 July 2023 - 15 August 2023.

Tools and materials

The tools used in this research study include a series of evaporator tools, a series of acid base titration tools, analytical scales, basins, choppers, 100 mesh (149 Mm) sieves, glass funnels, glass bottles, filter paper, glass beakers, apatulas, burettes. , 100 Ml, 250 Ml and 1000 Ml Measuring Flasks, 25 Ml Ball Pipette, Dropper Pipette, 500 Ml Erlemeyer, Sheet Bottle. Meanwhile, the materials used are Papaya Leaves, Jatropha Leaves, 96% Ethanol, Aquades, Indigo Sulfonic Acid, Potassium Permanganate 0.1125 N, Cotton. **Procedure for Making Pesticides**

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Wash the papaya leaves and Jatropha leaves, 2 kg each, drain each raw material, then dry in the sun, the dried samples are ground with a chopper to obtain powder, then sift the powder to a size of 100 mesh (149 μm).

Maceration Method Extraction

Put each sample into a glass bottle and add 96% ethanol solvent (papaya leaf extract = 3 L and Jatropha leaf extract = 3 L) soak the sample extract according to the time variable (2 days, 4 days, 6 days and 8 days) Gently insert the sample extract into a funnel that has been provided with filter paper on a measuring cup to separate the filtrate from the residue. Then each filtrate (papaya leaves and jatropha leaves) is evaporated.

EXPERIMENT PROCEDURE

The testing procedure for this research was research on Determining Tannin Levels, Pest Mortality (Armyworm).

RESULTS AND DISCUSSION

Research Results Data

Table 1. Data on Making Vegetable Pesticides Using Extraction Methods from Papaya Leaves (P) and Jatropha Pagar Leaves (J).

Raw Material Composition P:J (%)	Soaking Time (Days)	Mortality Power (Caterpillar)	Tannin Content (%)
100:0	2	5	0.0416
	4	4	0.0447
	6	4	0.0463
	8	4	0.0430
70:30	2	4	0.0436
	4	5	0.0353
	6	4	0.0434
	8	4	0.0426

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50:50	2	3	0.0218
	4	3	0.0397
	6	5	0.0474
	8	5	0.0407
30:70	2	5	0.0457
	4	5	0.0416
	6	4	0.0347
	8	5	0.0468
0:100	2	4	0.0393
	4	4	0.0347
	6	4	0.0357
	8	5	0.0395

Discussion

The pesticide used in this research was made from papaya leaves and jatropha leaves. After preparing the raw materials, they are dried in the sun, then ground with a chopper and sieved with a mesh size of 100, then extracted. The purpose of the extraction is to extract the active compounds contained in papaya leaves and Jatropha leaves. The extraction method used is maceration, because it is a simple, easy method and without heating so that the active compounds contained in the leaves are not damaged. Thisprocess aims to penetrate the leaf cell walls and enter the cell cavity which contains the active substance because there is a differencein concentration between the active substanceand that outside the cell, then the active substance is forced out, this happens repeatedly until there is a concentration balance between inside and outside cell.

Soaking compositions P and J with 96% ethanol solvent for 2; 4; 6; and 8 days ago, stir every 6 hours, because the solvent is polar and evaporates easily so it is good to use as an extract solvent. then evaporated to separate the extract and solvent to obtain a concentrated extract. Evaporation is the process of concentrating a solution consisting of a volatile solvent and a non-volatile solute. Evaporation is the process of thickening a solution by evaporating the solvent based onthe boiling point.

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Pest Mortality Test (Armyworm)

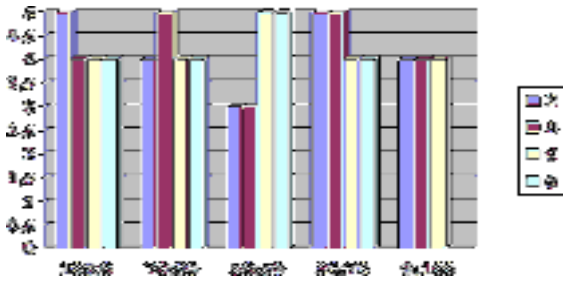

Figure 1 Armyworm Mortality Graph

From the results of the mortality power test, it can be seen that each composition has a different effect on armyworm mortality and soaking time. Armyworm (Spodoptera litura F) mortality from pesticides is caused by spraying the caterpillars so that the pesticide liquid hits the dorsal surface of the armyworm's body. Some of the pesticide liquid that sticks to the leaves will hit the ventral surface of the armyworm's body when the armyworm walks. Pesticides that enter through the surface of the body can pass through the thin cuticle, such as the connection between the body's pores. The mechanism for absorbing pesticides, apart from the skin, can also be through the digestive tract. Pesticides have a toxic effect on the stomach, which is the main organ for insect digestion because this part of the digestive tract is an organ that absorbs nutrients and secretes enzymes. If enzyme secretion is disrupted, the armyworm's digestive process will lack energy and over time it will die. The active compounds contained in pesticides accumulate in the armyworm's body and act as toxic because armyworms are cold-blooded. This toxin will be distributed to all body cells through the armyworm's circulatory system. Pesticides are sprayed on chili plants that are infested with armyworms and aphids. Armyworms usually eat leaves, disrupting the plant's photosynthetic ability. Aphids can cause plant damage by sucking cell fluids from the leaves, especially young leaves or shoots, after spraying. left for 48 hours until the pests disappear and the condition of the chili plants is fine, this shows that the pesticide sprayed does not affect the chili plants.

Test Tannin Levels

The results of the analysis of the tannin content of each composition showed that 100:0 with a soaking time of 2 days contained a tannin content of 0.0416%, soaking for 4 days contained a tannin content of 0.0447%, soaking for 6 days contained a tannin content of 0.0463%, and soaking for 4 days contains tannin content of 0.0430%. At 70:30 with a soaking time of 2 days it contains a tannin content of 0.0436%, soaking at 4 days contains a tannin content of 0.0353%, soaking at 6 days contains a tannin content of 0.0434%, and soaking at 8 days contains a tannin content of 0 .0426%. At 50:50 with a soaking time of 2 days it

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contains a tannin content of 0.0218%, soaking at 4 days contains a tannin content of 0.0397%, soaking at 6 days contains a tannin content of 0.0474%, and soaking at 4 days contains a tannin content of 0 .0407%. At 30:70 with a soaking time of 2 days it contains a tannin content of 0.0457%, soaking at 4 days contains a tannin content of 0.0416%, soaking at 6 days contains a tannin content of 0.0347%, and soaking at 8 days contains a tannin content of 0 .0468%. At 0:100 with a soaking time of 2 days it contains a tannin content of 0.0393%, soaking at 4 days contains a tannin content of 0.0347%, soaking at 6 days contains a tannin content of 0.0357%, and soaking at 8 days contains a tannin content of 0 .0395%.

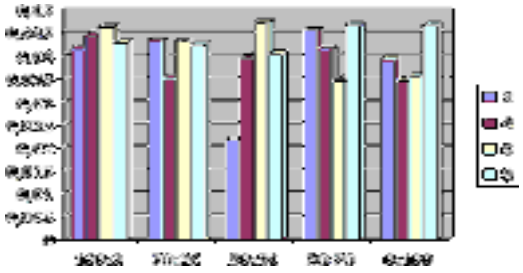

Figure 2 Graph of Tannin Content

Based on the data obtained, it is known that the highest tannin content was obtained on the 8th day of soaking in a ratio of 30:70 with a yield of 0.0468%, while the lowest tannin content was obtained on the 2nd day of soaking in a 50:50 ratio with a yield of 0.0218%. Soaking time affects the tanninlevels produced, the longer the soaking time,the higher the tannin levels produced.

CONCLUSION

Based on the research conducted, it can be concluded that the best variation of soaking time for pesticide raw materials is on the 8th day to meet the quality of vegetable pesticides.The pesticide composition of papaya leaves and Jatropha leaves reaches the quality of vegetable pesticides, pest mortality at a ratio of P30:J70 with a tannin content of 0.0468%.

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