

# Thesis: pesticide and plant essay sample

[Science](#), [Agriculture](#)



## Introduction

The Philippines is primarily an agricultural country. Most of the citizens that still live in rural areas support themselves through agriculture. One of the four sub-sectors of agriculture is farming. Farming is one of the common forms of livelihood in the country.

The rate of the crops produced here in the country shrank as of 1999 according to the Encyclopedia of Nations. One of the main reasons is the industrialization of farms. The farmers find it hard to establish large rate of growth because of the insufficient funds of the government to invest for the new devices, methods, and products that may help them secure their lives with farming.

The current industrial agriculture system promotes the reliance on agrochemicals, both synthetic fertilizers and pesticides, while neglecting to consider their negative effects on the economy of local communities, human health and the environment. The widespread use of irrigation, agrochemicals and new seeds have largely increased agriculture production, but this model of agricultural growth is flawed because of declining crop yields and massive environmental impacts. According to the recent Food and Agriculture Organization of the United Nations (FAO) data, between 1961 and 2005 fertilizer applications in the Philippines increased by 1000%, while yields of rice and maize increased only by 200% and 280% respectively, and the yield of pulses remained about the same.

From 1977 to 1987 pesticide use increased by 325%, while rice yield increased by only 30%. Pesticide imports have continued to increase, while

rice and corn yields have increased at a much smaller rate. In general, the excessive and inappropriate use of chemical fertilizers in crop soils cause land degradation and losses in soil fertility worldwide. Moreover, agrochemicals cause water pollution that directly and indirectly affects human health. According to the National Economic and Development Authority (NEDA), 37% of the total water pollution originates from agricultural practices, which include animal waste and fertilizer and pesticide runoff. Water pollution from nitrates derived from fertilizer runoff is more widespread in the Philippines than previously thought. Prior to the 1970s, the use of pesticides in Philippines was mainly concentrated in plantation crops. Small farms started to use pesticides intensely in the early 1970s.

During the period from 1972 to 1978 the import of pesticides in the Philippines grew some 500% (Mariano, 1999, Loevinsohn and Rola, 1998). The researchers formulated an organic pesticide which cannot affect the growth and the rate of production of crops. Pechay, scientifically known as *Brassica rapa*, is a common crop found in homes of most Filipinos. Though the pechay has a large number of produce in the country, farmers extract their time and effort to make large growth rate of pechay. They need to use pesticides and synthetic fertilizers for the growth of the crop. Another problem of the farmers aside to those is the pests inhabiting their plants in the field and the financial need to spend in farming. This is the idea why the researchers thought of making a study regarding an organic pesticide that is cheap, and highly effective in killing pests.

Since a common plant called utot ni hudas or baho – baho was found by the researchers to be a potential organic pesticide because of its toxin, the researchers thought of using this as a material for the study. The study was to know the effects of the baho-baho (*Lantana camara*) as an organic pesticide to the pechay plant.

### Statement of the Problem

The study was conducted to know the potential of the baho-baho (*Lantana camara*) as an organic pesticide to the pechay (*Brassica rapa*) plant.

Specifically, this study sought to provide answers to the following problems.

1. Is there any significant difference between the use of commercial pesticide and the baho-baho pesticide in killing the aphids in the pechay plant in terms of the number of leaves? 2. Is there any significant difference between the use of commercial pesticide and the baho-baho pesticide in killing the aphids in the pechay plant in terms of the number of aphids? 3. Is there any significant difference between the use of commercial pesticide and the baho-baho pesticide in killing the aphids in the pechay plant in terms of the height of the plant?

### Hypotheses

The researchers sought to find if the following hypotheses are to reject or to accept. 1. The organic pesticide formulated has no significant effect to the number leaves of the pechay plant. 2. The organic pesticide formulated has no significant effect to the number of aphids on the pechay plant. 3. The organic pesticide formulated has no significant effect to the height of the pechay plant.

### Significance of the Study

The study will be significant in the field of agriculture. The organic pesticide formulated may be used by farmers who have the same problems with the aphids. Since the ingredients and the materials used to make the baho-baho pesticide are abundant everywhere, the product may be easy to formulate and efficient. For farmers, instead of using commercial pesticide which have chemicals that pollute the farm soil, they can use the organic pesticide as an alternative and it is not costly.

Using the organic pesticide baho-baho plant may lead to the increase in number of crop production. According to Encyclopedia of Nations, since 1999 the number of yield of farmers in the Philippines decreased because of lack of devices, and new ways of farming. This research may be beneficial to the farmers having those problems in farming.

This study may also contribute to the existing knowledge regarding the baho-baho plant and its effects to the aphids and in the growth of the *Brassica rapa*. Some may utilize baho-baho plant for other studies such as its effects to other kind of pests and other types of plants. Researchers may find this product a good material for business purposes. They may create other products with the baho-baho plant such as pest killing products, repellent, and many other purposes.

Moreover, this will help in the field of botany. Other information regarding the topic may be created and made by other researchers and institutes. This may lead to using the baho-baho plant in other fields of sciences.

### Scope and Limitation

The study was conducted to gain knowledge about the effectiveness of the baho-baho (*Lantana camara*) utilized as an organic pesticide. It discusses the potential of the organic pesticide when utilized by the farmers for productive farming which was determined by the change in the number of aphids introduced to the *B. rapa*, the change in the length of its stem, and factors that may determine that the growth of the pechay is affected by the organic pesticide.

The study was conducted in the Bacoor National High School Molino – Annex. The *Brassica rapa* were planted in soil taken from farms near the place where the study was conducted. It has taken more than a month for the researchers to complete the whole experimentation. It consists of twenty (20) days consumed in growing the pechay (*B. rapa*) and fifteen (15) days for the observation of the effects of the baho-baho (*L. camara*) organic pesticide to the aphids invading the leaves of the pechay (*B. rapa*).

The study did not include the effects of the baho-baho plant to the soil where the pechay was planted. The changes to the growth of the plant due to some environmental factors like the change in climate and salinity of the soil is not considered in the study. The researchers did not also include the health benefits of the produce treated with the pesticide and the effects of the plants when it is eaten.

### Theoretical Framework

The baho-baho plant has been known for its toxicity and its odor for its protection to itself. Since it has been noted that the pesticide was already

used in repelling forest insects, there might be a large possibility that it can also be used to the insects or pests inhabiting the farmlands. The odor of the *L. camara* may repel kinds of pests such like the aphids. In the study, the baho – baho (*Lantana camara*) is utilized to create an organic pesticide that may repel pests and other inhabitants to the plant pechay (*Brassica rapa*). The following is a diagrammatic representation on how the study was done.

Fig. 1. 1 Independent Variable, Intervening Variables, Dependent Variable

### Definition of Terms

The following are some of the operational terms that are used in the study.

1. antifeedant activity. This refers to the ability of the pesticide to decrease the average amount of leaves eaten by the aphids
2. growth rate. This refers the change in the number of leaves, change in the length of the stem, change in the color of leaves, etc. upon a limit of time.
3. no-choice test. It is the test taken from the study of Roman Pavela, Department of Entomology, Division of Plant Health, Crop Research Institute, Prague-Ruzyně, Czech Republic used to determine if the pesticide has significant effect to the rate of the eating capacity of the aphids.
4. organic pesticide. This is the product formulated from the baho – baho (*Lantana camara*) after decoction utilized as pesticide to the pechay (*Brassica rapa*).

Chapter 2

### REVIEW OF RELATED LITERATURE

The study utilized the baho – baho plant (*Lantana camara*) as an organic pesticide to the plants. Specifically, the product was used in the brassica rapa commonly known in the Philippines the pechay plant. Likewise to the study, Efficacy of *Lantana camara* L. and *Tephrosia vogelii* Hook against

*Sitophilus zeamais* (Coleoptera: Curculionidae) in Stored Maize Grains. They have used the *Lantana camara* for killing farmland pests. It is noted that the toxicity of the baho-baho (*Lantana camara*) has a slow but significant effects to the mortality of the weevils of the maize plants. Moreover, the researchers of the said study had concluded that there will be a 100% killing if the pesticide was applied for more days.

This ensures the researchers that the study will also be having positive result like the study on the weevils. Another study to support this is the, adulticidal activity of essential oil of *Lantana camara* leaves against mosquitoes, has revealed that the *Lantana camara* has been effective in repelling mosquitos, and even more effective if exposed for greater amounts of longer period of time. This shows that the *Lantana camara* is effectively arising in this field. It means that the plant also have greater chances of repelling aphids to the pechay plant since its effectiveness has already been noted for other purposes. According to a research study of the Department of Biochemistry of India, Evaluation of Larvicidal Effect of *Lantana Camara* Linn Against Mosquito Species *Aedes aegypti* and *Culex quinquefasciatus*, it was clearly noted that he baho baho plant is having a larvicidal activity against mosquitoes which prevents their number to grow.

Another study in the *Lantana camara* as an organic pesticide has reduced the pest infestation in the bud and bloom of the pink orchid by applying this two times a week. This also enhanced the production of the vegetabe leaf number. (Ramli et. al., 2007) As to the conclusion of the researchers of the The Effects of Extracts of *Lantana camara* (L.) and *Azadirachta indica* (A.



Juss) on the Population Dynamics of *Plutella xylostella*, *Brevicoryne brassicae* and *Hellula undalis* on Cabbage it has noted that, the use of plant extracts with insecticidal properties has the potential of reducing the effects of insect pests of agricultural crops. These can be of importance to the resource-poor farmers in many areas of the developing world. The significant reduction in pests' numbers on the treated plants was an indication that they can be used as alternatives to chemical insecticides. Even though various pest species attacked the cabbage plants, *P. xylostella* caused the most serious damage. It was the main cause of reduction in weight of cabbage heads.

#### Justification of the Study

The related studies show that this study is original and feasible. It has never been done in any other works of other researchers. Some are seem to be similar to this study but there are variations that make this research study original. The materials and the instruments used in the study are affordable and can be found in most homes that make this study feasible.

#### Chapter 3

#### MATERIALS AND METHODS

##### Research Method

The researchers utilized the parallel-group design to the particular experimentation in the study. Of the different groups that were used, one was used as the control group while others varies a single variable for comparative purposes.

In the experimentation, three setups were done. Each setup was introduced with ten larvae of the plant pests. In the test of the mortality of the aphids (Homoptera), the control group was the pechay (*Brassica rapa*) untreated with any substance. The experimental groups are those treated with baho-baho (*Lantana camara*) organic pesticide and commercial pesticide.

## Materials

The materials used in the proposed study were five stems of baho-baho plant for about 6 to 8 inches; 6 pechay plant; 500 mL of water; and 30 larvae of aphids (plant lice). These materials and ingredients are presented in a table below.

Materials and Ingredients	Quantity	Baho-baho( <i>Lantana camara</i> ) plant, 6 to 8 inches	5 stems	Water	500 mL	Pechay plant	3 pots	Larvae of Aphids	30 units
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Table 3. 1. Materials and Methods Used in the Study

## Equipment and Utensils

The equipment and utensils used in the preparation of the organic pesticide are as follows: spray bottle with spray nozzle, gallon jug, funnel, cloth (bandanna), pot, and knife. The table below shows the equipment and utensils used in the study.

## Procedure

In the organic pesticide, the baho-baho was chopped into smaller pieces. Using the five hundred (500 ) milliliter ( mL) of water and pot, the researchers proceeded to the decoction of the plant. The funnel and the cloth were used as strainers to the decocted substance to be put inside the gallon jug. It was put to the bottle with spray nozzle for the experimentation.

The study utilized three setups for the experimentation. The setup A is the controlled setup is without any treatment of pesticide. In the setup B, the plant was treated with the formulated organic pesticide which was the experimental setup. The setup C was treated with commercial pesticide for comparison to the results of the experimental setup.

For each setup, ten larvae of aphids (Homoptera) will be introduced. The observation will be taken up for fifteen days. A tally sheet was prepared for each setup noting the day of the observation, number of larvae remained, and number of larvae reproduced (if there are). After those, the researchers proceeded to the antifeedant activity of the organic pesticide.

The flow sheet shows how the experimentation was done by the proponents.

### Statistical Treatment

For the two experiments, the statistical tool used in analyzing and interpreting the data will be the t-test formula. This will show if the differences in the data gathered are significant.

The researchers computed for the t values between the setups A and B, setups B and C, and between setups C and A, for the number of aphids in the

three (3) setups. They also computed for the t values between the number leaves of the plant pechay between the setups A and B, setups B and C, and between setups C and A. using the t-test formula, they also computed for the t values between the setups A and B, setups B and C, and between setups C and A.

## Chapter 4

### ANALYSIS OF DATA AND INTERPRETATION

This chapter of thesis includes list of tables which compiles all the data gathered by the researchers in the experimental procedure of this research paper. Tables are explained textually to add clearer information for the data gathered in the study.

As said, the Table 4. 1 contains the data for the observation in the change in the number of leaves of the pechay (*Brassica rapa*) plant after the 15-day observation of the three setups which includes setup A (controlled setup), setup B (baho-baho organic pesticide), and setup C (commercial pesticide).

The summation of all the values in setup A in the number of leaves is 16. The setup B has a total value of 38 and the setup C has 30. This computes for the mean of setup A of 1. 07 and for the setup B 2. 53. The setup C has a computed mean value of 2. The summation or total of all the difference between the computed value and the mean of the three setups are 0. 05 for setup A, 0. 41 for setup B, and 0 for setup C. The values listed on the table are beneficial for the computation of the t - value for the t - test in the study.

Another table, Table 4. 2 which includes the data gathered from the experimental procedure used for the computation of the values needed for the t-test in the number of aphids of the three setups for (15) fifteen days.

The computed total of all values in setup A is 16. In setup B there is 6 total variables and 13 in setup C for the number of aphids on the plant pechay. The mean value of setup A is 1. 07, 0. 4 in setup B, and 0. 876 in setup C. The summation or total of all the difference between the computed value and the mean of the three setups are 2. 05 for setup A, 4 for setup B, and 0. 05 for setup C. The summations of the square differences in the mean and the computed value are 45. 14 in setup A, 30. 4 in setup C, and 25. 72 in setup C.

The following table list the data gathered by the researchers for the height of the plant for the whole fifteen day of the experimentation. This includes the values needed for the computation of the t value in the t – test.

The summation of all the values in setup A in the number of leaves is 30. The setup B has a total value of 109. 7 and the setup C has 155. 1. The mean value of setup A is 2, 7. 31 in setup B, and 10. 34 in setup C. The summation or total of all the difference between the computed value and the mean of the three setups are 20 for setup A, 0. 05for setup B, and 0 for setup C.

The following table is a list of all the t – values computed by the researcher to be compared with the 0. 5 level of significance with a 14 degree of freedom. This is very crucial to the study especially in the results and drawing of conclusion.

The table shows in the height of the stem when the setup A is compared with setup B, the t value computed will be -1.66 while -1.15 in setups B and C, and 2.16 in the setup C compared to the setup A. For the number of leaves, the setup A with B when compared got a t value of 1.72. The setups B and C when compared got a t value of 2.03 while the setups C and A has a computed t of 0.9. in the number of aphids, the setups A and B has a t value of 2.20, the setups B and C with a t value of 0.72, and the setup C and A with 2.23.

From the data tables above, it can be inferred that from the values of the controlled setup compared to the two setups applied with pesticide, the two pesticides has prolonged the life of the pechay plant. The pesticides have been significant to the killing of the aphids applied in the setups. Meaning, the two pesticide affected the number of aphids in the plant introduce for (15) fifteen days.

## Chapter 5

### SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary of the Findings

The main purpose of the study is to know the effects of baho – baho (Lantana camara) plant on the plant pechay when it is utilized as an organic pesticide. This suits the parallel group design of a study having (10) ten aphids to consider for (3) setups: Setup A (controlled setup), setup B (baho – baho organic pesticide), and setup C (commercial pesticide).

Upon getting the t values of the setups in the height of the stem, the data shows that from the t values of -1.66, -1.15, and 2.16 of the (3) three setups with the 0.5 level of significance at the 14 degrees of freedom is not significant with the tabular data 2.145. This means that the pesticides did not affect the plant.

This is the same with the number of leaves with the t values of 1.72, 2.03, and 0.9 on the degrees of freedom of 14 with 0.5 level of significance for the three setups. This also shows that there are no significant relationships between them. Meaning, both the pesticides did not affected the growth of the plant. This answers the problem stated in the chapter 1 of this paper that asks if there is a significant difference between the pesticides and the controlled setup in terms of the number of leaves of the plant and the height of the stem of the pechay. This accepts the null hypotheses for the two problems.

In the number of aphids of the plant, the data shows that with the t value of 2.23 for the setups A and B with the level of significance of 0.5 and 14 degrees of freedom compared to the tabular value of 2.145 is significant. This means that the pesticide affected the aphids in their number and in inhabiting the plant. This is the same with the setups C and A with a t value 2.23 with the same degree of freedom and level of significance. This rejects the null hypothesis of the study that states that there is no significant difference in the setups in terms of the number of aphids.

Conclusion

From the findings gathered by the researchers, the following are the conclusions made as further explanation to the findings in the study.

1. The aphids really affects the growth of the pechay (*Brassica rapa*) plant as it is shown that for about (5) five to (6) six days the controlled setup (not applied with any pesticide) has died which was shorter than the period of the two setups applied with the pesticide.

2. The two pesticides, commercial pesticide and baho-baho pesticide, did not affect the pechay plant in growth which means that both of the pesticide is not harmful to the plant in experiment.

3. Both the pesticides have been effective in killing the number of aphids in the setup. Since the commercial pesticide has greater value of significance, this means that it is more effective than the baho-baho organic pesticide.

4. The baho-baho organic pesticide is a potential plant for agriculture since it has shown significant effects to kill the aphids applied in the pechay plants.

### Recommendations

From the conclusions stated, the researchers formulated the following recommendations for the study.

1. The study has shown that the baho -baho plant pesticide has been effective in killing or decreasing the number of aphids in the plant pechay. It is recommendable for other researchers to use the pesticide for other kinds of plant and to utilized large number of pests for a more recognizable result.



2. It is better for other studies to consider the factors that affect the growth of the plant when doing the same setup of the study. These factors may have done a great effect to the results of the study.

3. It is recommendable for further researches of this study to consider the times of application of the study. The researchers thought that the growth of the plant was affected by the daily application of the pesticides. This might have been the reason of the early withering of the plant.