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Bignay (*Antidesma Bunius*) Leaf Extract Stands as an Organic Pesticide against Rice Black Bugs (*Scotinophara Coarctata*)

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ABSTRACT

This research aimed to sought solutions to the growing problems of rice black bugs (*Scotinophara coarctata*) damaging the rice crops of farmers. This study used an experimental method to determine which solution is effective against rice black bugs. Bignay (*Antidesma bunius*) leaves were collected, cut, soaked in water, crushed using a mortar and pestle, and extracted using a thin cloth. The extracts of the leaves were then placed in 4 different concentrations in bottles. 6 bugs were soaked in each solution, respectively, but with different periods (3, 5, and 10 min). We found that the extract is lethal towards black bugs since it has anti-bacterial activity, even though it damaged the rice crops. Bignay fruit was intended to be utilized as another variable, but due to the weather, fruits were not yet visible in the Bignay tree. We concluded that the thickness of the solution served as the main reason why the rice black bugs died. The result of this study can be utilized to address the rising problems caused by rice black bugs.

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1. INTRODUCTION

One of the major problems in our Agriculture these days, especially in Asia is the loss of rice fields caused by pests such as rice black bugs (*Scotinophara Coarctata*).

Bignay (*Antidesma bunius*) is a wild fruit plant that belongs to the Family Plantanaceae. The probability of Antidesma Bunius as a foundation of natural preservative is examined (Belmi *et al*., 2014). It can be used as a natural ingredient with a biological function due to its antioxidant and antimicrobial properties (Zaman *et al*., 2018). The different parts of this bignay plant can be used in many different ways: a pesticide agent, anti-diabetic, antioxidant, antiradical, and thrombolytic (Islam *et al*., 2018). Its leaves are known to contain Alkaloids and Saponins, which are huge contributions to Pesticides (Belina-Aldemita *et al*., 2013).

Bignay leaf extract's ability as an organic pesticide is being explored in this research. The goal of this research is to develop an organic pesticide that is safe for humans and the environment. This study shows: the efficacy of bignay leaf extracts towards rice black bugs. In making the Bignay leaf pesticide, we extracted bignay leaves and used water as a solvent.

2. METHOD

The true experimental research design was used for this study. This type of research relies on statistical analysis to prove or disapprove a hypothesis, which makes it the most accurate form of research.

The study was conducted for three weeks with 3 attempts. Bignay leaf extract was used and cut into tiny pieces then clasped by a thin cloth and the bignay extract was released. Four bottles were prepared with 25, 50, 75, and 100% of bignay leaf extracts. Water was used as the solvent. Rice black bugs were required for the trial, gathered, and placed in the crops. The concentrations were sprayed on the crops and the black bugs.

3. RESULT AND DISCUSSION

The results of the 1st, the 2nd, and the 3rd trial of determining the efficacy of Bignay leaf pesticides are shown in **Tables 1, 2,** and **3**, respectively. These trials are important to show until what times the pesticides are effective for killing the target.

The results for the 1st trial of different Antidesma Bunius concentrations are shown in **Table 1**. Each box represents the Mortality Rate of the Rice Black Bugs who were exposed at different times. 25% didn't show any signs of effectivity to the Bugs after being exposed for 3 to 10 minutes, same results were distributed by 50%. 3rd Concentration gave results that presented effectiveness to the bugs in contrast to the 1st and the 2nd concentrations. The 3rd and the 4th concentrations gave out similar results. Results for the 2nd Trial (see **Table 2**) determined that Concentration 3 and 4 frequently weakened the rice black bugs other than killing them.

Table 3 shows the results of the last trials. Both 1 and 2 are not effective towards Scotinophara Coarctata, while 3 shows only weakening in 5 and 10 minutes therefore Concentration 4 is different from other solutions. We used 75% Antidesma bunius and 25% Alcohol in Table 5, for alcohol has antibacterial activity and was proven to be lethal towards Scotinophara Coarctata. It did show results but also showed that it damages crops. Therefore in conclusion Black bugs are more likely dying and weakening due to asphyxiation or drowning instead due to the thickness of the solution.

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Table 1. The results of the 1st trial of determining the efficacy of Bignay leaf pesticides.

	C1 (25%)	C2 (50%)	C3 (75%)	C4 (100%)
3 minutes	0/2	0/2	2/2 weakened	2/2 weakened
5 minutes	0/2	0/2	2/2 weakened	2/2 weakened
10 minutes	0/2	0/2	1/2 died,1/2 weakened	1/2 died,1/2 weakened

Table 2. The results of the 2nd trial of determining the efficacy of Bignay leaf pesticides.

	C1 (25%)	C2 (50%)	C3 (75%)	C4 (100%)
3 minutes	0/2	0/2	0/2	2/2 weakened
5 minutes	0/2	0/2	2/2 weakened	2/2 weakened
10 minutes	0/2	0/2	2/2 weakened	2/2 weakened

Table 3. The results of the 3rd trial of determining the efficacy of Bignay leaf pesticides.

	C1 (25%)	C2(50%)	C3 (75%)	C4 (100%)	C5 (75%)
3 minutes	0/2	0/2	0/2	2/2 weakened	2/2 weakened
5 minutes	0/2	0/2	2/2 weakened	2/2 died	2/2 died
10 minutes	0/2	0/2	2/2 weakened	2/2 died	2/2 died

4. CONCLUSION

According to the results, 2 out of 24 black bugs were killed in the first trial, 0 out of 24 in the second trial and 8 out of 30 died in the first trial. Additionally, the thickness of the solution served as the reason why the rice black bugs died. Furthermore, the mortality rate depends on the concentration of bignay leaf extract.

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6. AUTHORS' NOTE

The author(s) declare(s) that there is no conflict of interest regarding the publication of this article. The authors confirmed that the data and the paper are free of plagiarism.

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7. REFERENCES

Belina-Aldemita, M. D., Sabularse, V. C., Dizon, E. I., Hurtada, W. A., and Torio, M. A. O. (2013). Antioxidant properties of bignay [Antidesma bunius (L.) Spreng.] wine at different stages of processing. *Philippine Agricultural Scientist*, *96*(3), 308-313.

Belmi, R. M., Giron, J., and Tansengco, M. L. (2014). Antidesma bunius (bignay) fruit extract as an organic pesticide against Epilachna spp. *Journal of Asian Scientific Research*, *4*(7), 320.

Islam, S., Koly, S., Zaman, S., Sukorno, F., Ahammed, S., Munira, S., and Hridoy, R. (2018). Estimation of phytochemical, antioxidant screening profile and thrombolytic activities of methanolic extract of Antidesma bunius L. leaf. *International Journal of Horticultural Science and Technology*, *6*(2018), 358-363.

Zaman, S., Islam, M. S., Koly, S. F., Faisal, T., and Rakib, K. (2018). Evaluation of Cytotoxicity and Antibacterial Activities of Methanolic Extract of Antidesma bunius (Linn.)(Family Euphorbiaceae) Leaf. *Journal of Advances in Medical and Pharmaceutical Sciences*, *16*(2), 1-7.

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