



Insecticidal Effects of Butterfly Pea (*Clitoria Ternatea*) Leaf Extract Against Mosquito Wrigglers

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ABSTRACT

The purpose of conducting this research is to determine the effectiveness of blue ternate (*Clitoria Ternatea*) leaf extracts for terminating mosquito wrigglers by making a mosquito larvae insecticide. To determine the effectiveness of the leaf extract to terminate mosquito wrigglers, a mortality test was conducted. The numbers of the dead mosquito wrigglers were checked every 5 min. The results showed that the blue ternate leaf is effective to eliminate mosquito wriggler and the amount of leaf extract in the ethanol brings different effectiveness. The present study showed that both ethanolic extract and pure leaf extract of *Clitoria Ternatea* are effective as insecticidal against mosquito wrigglers. The insecticidal effects of *Clitoria Ternatea* against mosquito wrigglers will contribute largely to the people, to help those people who cannot afford to buy insecticide and to lessen the number of people who encounter diseases caused by mosquitoes.

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1. INTRODUCTION

Nowadays, most populations are afflicted by mosquito-borne illnesses such as dengue fever, malaria, and the Zika virus. Dengue and other transmittable diseases have been a fear for the community since they can cause a death of a person (Oguis et al., 2019). The researchers have collected a large amount of body evidence that shows the potential immense of medicinal plants (Chauhan et al., 2012). Butterfly pea is a multi-purpose legume; it gives bioactive compounds for medicinal use (Gomez & Kalamani, 2003). Blue ternate (*Clitoria ternatea*) was proven to possess an insecticidal property (Mathew et al., 2009). Effective extracts may result in the identification of a useful molecule for the control of mosquito vectors (Ajesh & Sreejith, 2014).

This study aims to determine the effectiveness of *Clitoria Ternatea* leaf extracts by making a mosquito larvae insecticide. Specifically, this study showed the impact difference between Pure and 50% of the leaf extract under ethanolic solution based on its effectiveness against mosquito wrigglers.

2. METHOD

Figure 1 shows the procedure that has been done during the experiment. In this research, a mortality test was performed to assess the efficacy of the extracts. It is also done to determine which of the two treatments is more effective as a wriggler insecticide.

In evaluating the significant difference between the independent group and variables between concentration levels, Analysis of Variance (ANOVA) was used. The basis of this was based on the statement of the problem of the research report.

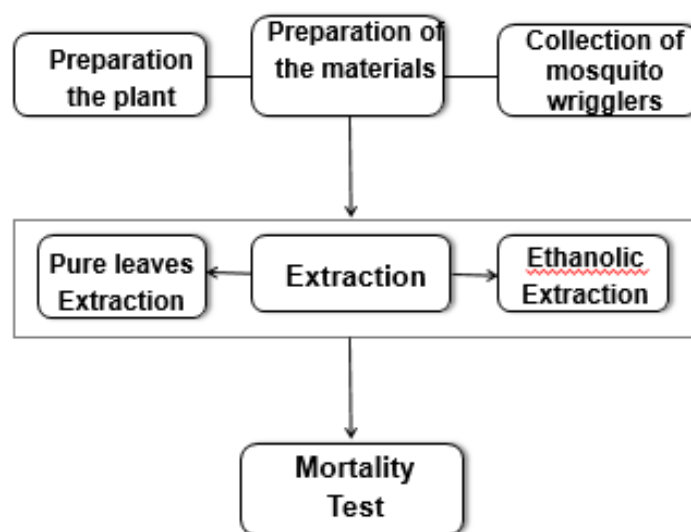


Figure 1. Flowchart of the procedure.

3. RESULT AND DISCUSSION

3.1. Mortality Test Result

In Table 1, we provide 2 treatments and performed 4 replications for each treatment. The result showed that 50% of blue ternate and 50% of ethanolic extract is more effective with a mean of 2.75 that interprets as having a high effectivity. It was followed by the Pure Leaf extract with an average of 1.25 that interprets as having low effectivity. Overall we surmised that blue ternate is effective; thus 50% of blue ternate and 50% of ethanolic extract are more effective than the pure extract.

Table 1. Effectivity of Pure leaf extract and 50% Clitoria Ternatea Leaf extract and 50% Ethanolic extract.

Treatment	Replication	Mean	SD	Interpretation
Pure Left Extract	0 1 1 3	1.25	1.25	Low Effectivity
50% Clitoria Ternatea and 50% Ethanolic extract	2 3 3 3	2.75	0.5	High Effectivity
Total		2	0.88	Moderate Effectivity

3.2. ANOVA Result

Table 2 shows the results on the difference between Pure extract and 50% of Clitoria Ternate and 50% Ethanolic Extract. Based on the table, in as much the computed t-value, $t_c = 0.07$ and lesser than the t-critical value of 2.44, 5% level of significance, then we can say that there is sufficient evidence to accept the null hypothesis. Therefore, we can conclude that there is no significant difference between pure and 50% of the leaf extract.

The non-significance result shows that the effect or performance of these treatments is the same. This means that both types of blue ternate leaf extract either pure or with the addition of 50% ethanol have the same effectiveness. The blue ternate leaf extract with the addition of 50% ethanol has the same effectiveness as the pure extract because the addition of ethanol makes it more insecticidal activity due to an increase in the high anthocyanin content. Besides, the high anthocyanin content makes for good antimicrobial activity as well (Shahid *et al.*, 2009; Anthika *et al.*, 2015; Ajesh & Sreejith, 2014).

The Insecticidal effects of blue ternate leaf extract against mosquito wrigglers will contribute largely to the people, especially to those who live in tropical areas who are suffering the outgrowth of the mosquito wrigglers and mosquitoes which causes Malaria, Zika Virus, and the most quotidian effect is the Dengue.

Table 2. Test the difference between pure extract left and 50% of blue ternate and 50% of ethanolic extract using T-test.

Treatment	Degrees of Freedom	T - Computed Value	T - Values (two -tail)		Interpretation
			0.05	0.01	
Pure Extract Left 50% Clitoria Ternate and 50 % Ethanolic extract	6	0.07*	2.44	3.14	There is no significant difference

*not significant at 5% level

4. CONCLUSION

Based on the overall results, the conclusions are blue ternate leaf has an insecticidal property that can eliminate mosquito wrigglers. The present study showed that the pure leaf extract is effective as an insecticidal against mosquito wrigglers. The effect of the leaf extract is highly proven and it was also effective against mosquito wrigglers in such a short time. The leaf extract is more effective as insecticidal against mosquito wrigglers. This study can help giving information that is prospective for decreasing death rates from mosquito-caused diseases.

5. ACKNOWLEDGMENTS

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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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