



A Comparative Study on the Efficiency of Heart-Leaved Moonseed (*Tinospora crispa* L.) Extract Concentrations in Eliminating *Aedes Mosquito* Larvae (*Aedes aegypti*)

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Abstract

This study aims to test the effectiveness of heart-leaved moonseed extract with ethanol solvent to eliminate mosquito larvae and to study the relationship between the concentration of extract and death rate of mosquito larvae under controlled conditions. The experiment is divided into 4 levels of extracts, namely 2.5, 5, 7.5 and 10 ppm, and tested in different volumes of 10, 20 and 30 milliliters at each concentration level. Compared to the control set (clean water), the number of experiments was determined, 3 times per set by controlling the factors of temperature, light, and pH to be suitable for the survival of the larvae. Recorded mortality and physical changes continuously for 7 days. The results of the study found that heart-leaved moonseed extract can cause mosquito larvae to die statistically significantly ($P < 0.05$). The mortality rate has a correlation with the concentration of the extract, that is, when the concentration increases from 2.5 ppm to 10 ppm, the mortality rate of mosquito larvae will increase accordingly. In addition, physical changes in the larvae in the group

Introduction



Study sites



Princess Chulabhorn Science High School Trang
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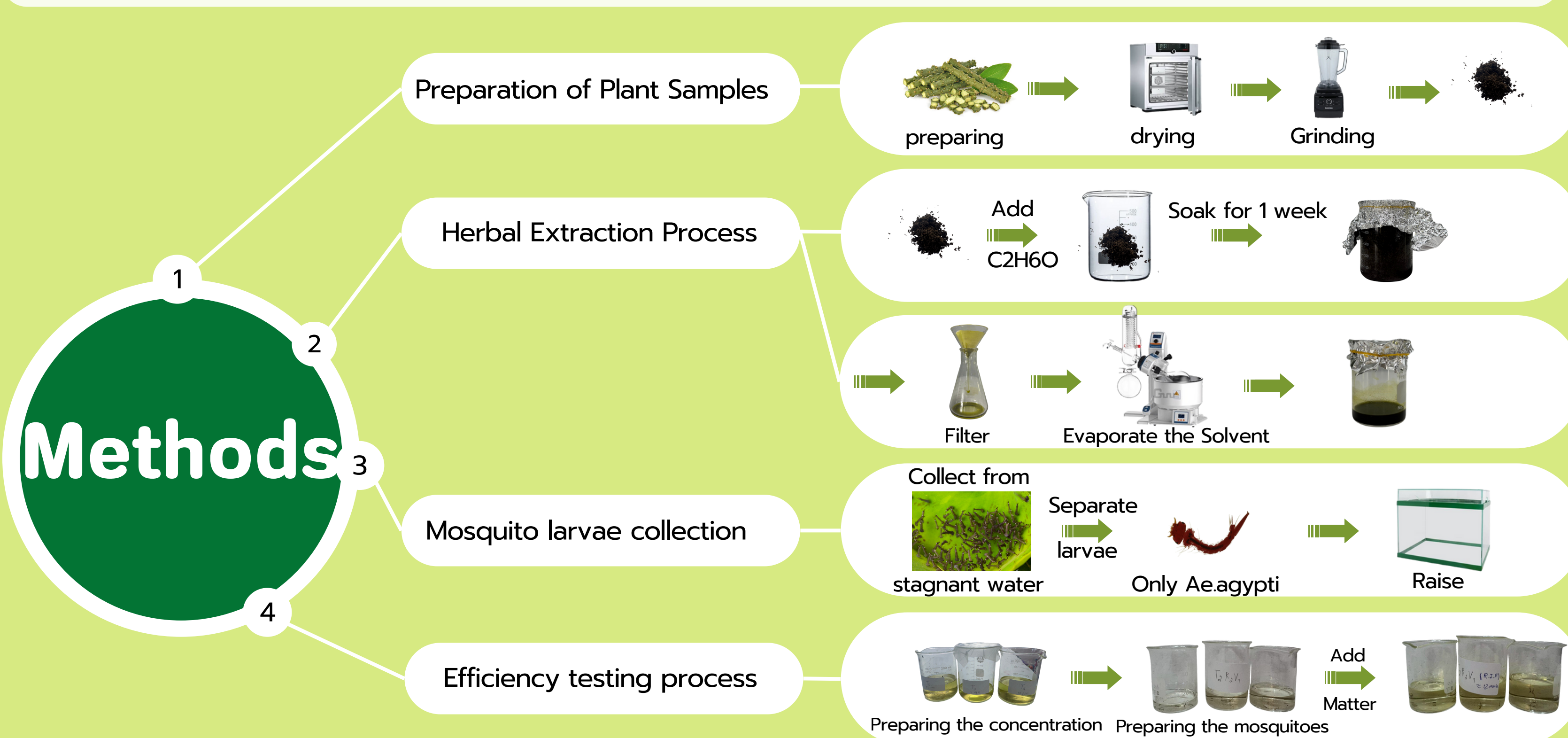
Student's house
 112/2 Village No.5, Bang Kung Subdistrict, Huai Yot District, Trang Province

Research Question

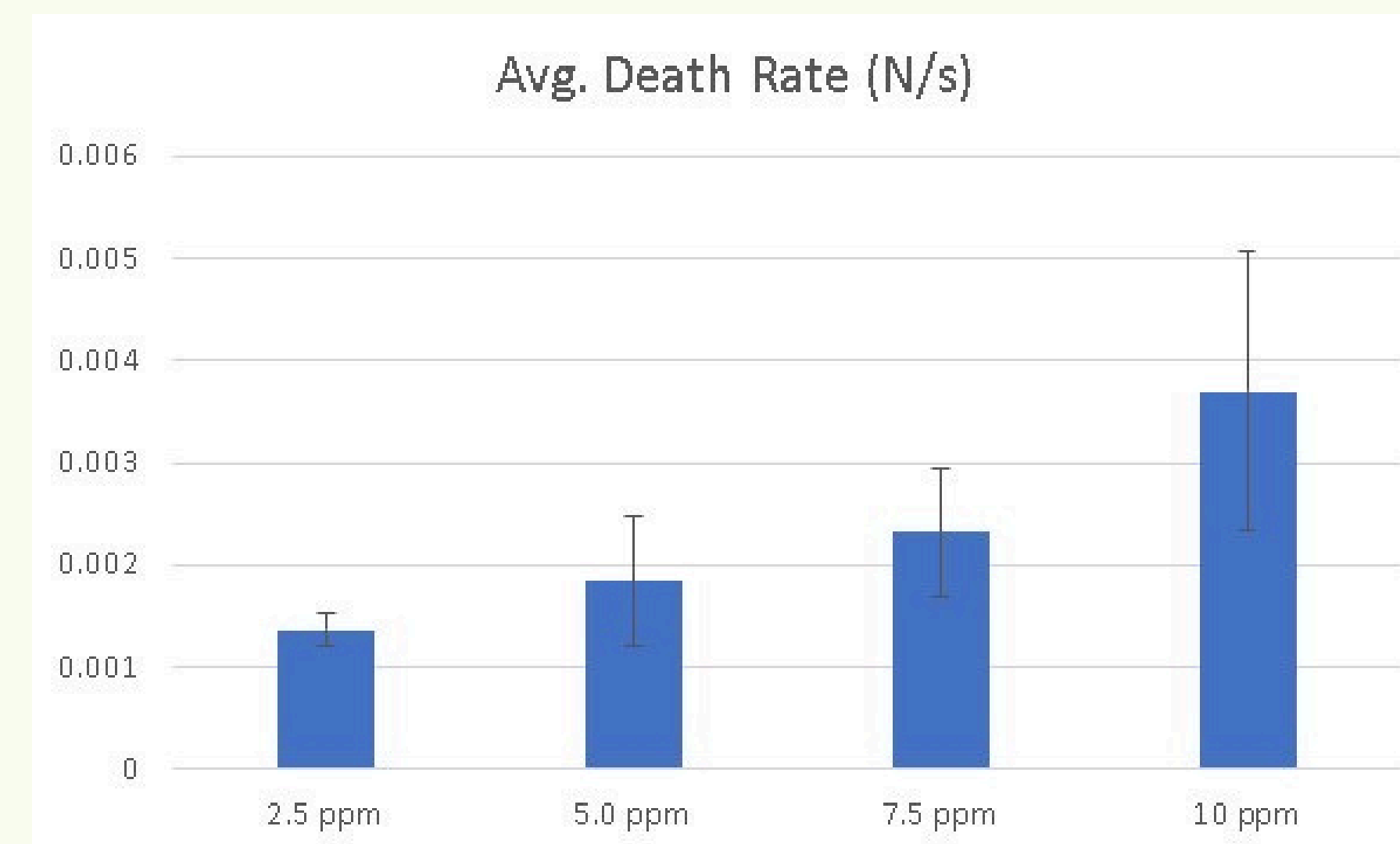
Does the extract of *Tinospora crispa* L. have different levels of effectiveness in eliminating mosquito larvae at different concentrations?

Hypothesis

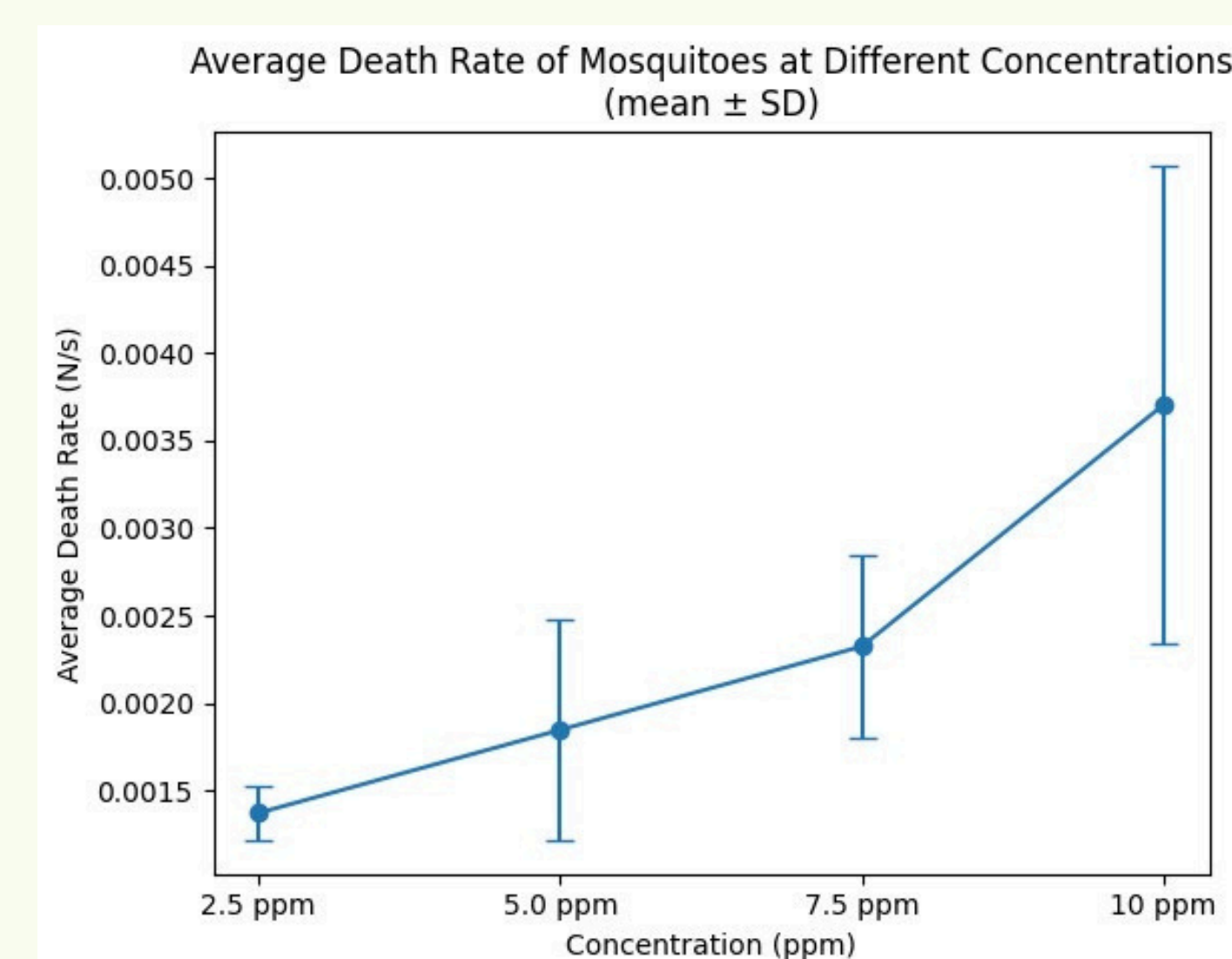
Different concentrations significantly affect the effectiveness of mosquito larval control.



Results



From the chart, it was found that the concentration of heart-leaved moonseed extract affected the mosquito mortality rate at a significant level of .05.



From the chart, it was found that the volume of concentration of heart-leaved moonseed extract affects the mosquito mortality rate. Different at a significant level of .05

Conclusion and Discussion

The results of this study showed that the mortality rate of mosquito larvae increased as the concentration of *Tinospora crispa* extract increased. Mosquito larvae exposed to higher concentrations had significantly higher mortality rates compared to the control group, indicating that the extract has a concentration-dependent larvicidal effect.

The experiment consisted of four groups: a control group and four treatment groups with *Tinospora crispa* extract concentrations of 2.5, 5, 7.5, and 10 ppm. The highest mortality rate was observed in the group treated with 10 ppm extract. Statistical analysis using two-way ANOVA with replication confirmed that the mortality rates in all treatment groups were significantly different from the control group ($P < 0.05$).

The larvicidal effectiveness of *Tinospora crispa* may be attributed to bioactive compounds such as diterpenoid lactones and alkaloids, which can interfere with the digestive and nervous systems of mosquito larvae, leading to increased mortality.

In conclusion, *Tinospora crispa* extract is effective in eliminating mosquito larvae, particularly at higher concentrations, and shows potential as a natural and environmentally friendly alternative to larvicides.

Citations

Chandra, G., Pal, J. K., Rawani, A., & Singh, A. (2016). Larvicidal activity of *Tinospora crispa* (Menispermaceae) fruit extract against filarial vector *Culex quinquefasciatus*. *Journal of Mosquito Research*, 6(35), 1–8. <https://doi.org/10.5376/jmr.2016.06.0035>

Mahidol University. (2019). Efficiency of *Tinospora crispa* against *Culex quinquefasciatus* larva [Master's thesis, Mahidol University]. Mahidol University Repository. <https://repository.li.mahidol.ac.th/handle/123456789/50919>

Singh, A. J., Pal, J. K., & Chandra, G. (2017). Efficiency of *Tinospora crispa* against *Culex quinquefasciatus* larva. *Journal of Arthropod-Borne Diseases*, 11(2), 335–341. <https://pubmed.ncbi.nlm.nih.gov/29869741>

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