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THE EFFICACY OF BANGBANGSIT (LANTANA CAMARA LINN) AS ORGANIC KATOL

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Abstract

This study explores the efficacy of the developed Bangbangsit katol (Lantana camara Linn.) using dried young and matured leaves, and flowers of the plants in treating mosquitoes. L. camara is known to contain repellent properties to insect pests. Philippines, particularly in its countryside like Quirino province, hosts L. camara pandemically in its topographies. On the other hand, mosquitoes had been one of the vectors of the world's pandemic health problem of serious human diseases that threaten human existence, i.e. zika virus, malaria, dengue fever, chikungunya, among others. Young and matured leaves and flowers of L. camara were freshly picked, air dried, and pulverized. The bangbangsit katol was developed by mixing the pulverized L. camara and corn starch. Corn starch was used as binder in forming the katol. Mosquitoes were cultured and subjected to the fume of the burnt L. camara katol: T1 - young leaves, T2 - matured leaves, and T3 – flowers. Time of death and the number of dead mosquitoes were determined and compared. Findings revealed that there is no significant difference on the number of killed mosquitoes across treatments in the study; however, mortalities in T2 and T3 were found significantly higher when compared to T1. Therefore, Bangbangsit katol (L. camara) is potential in treating deleterious mosquitoes.

Keywords: Lantana camara Linn, Bangbangsit, Diris, Organic Katol.

1. Introduction

Lantana camara Linn. (verbenaceae), also known as *diris* or *bangbangsit* in the Philippines, is a hardy, evergreen, and straggling shrub with characteristics odor that grows up to 3m high. It is a perennial shrub found pandemically in all the terrains of Philippines as it already used as an ornamental plant in most residential areas due to its flowers' appealing elegance and color. On the other hand, it is an invasive weed in farms that threatens agricultural species and useful microorganisms as it is found to have allelopathic effects.

Concomitantly, *L. camara* is claimed to be of an array of uses. All parts of this plant had been used traditionally for several ailments throughout the world. Its leaves are used as antitumeral, antibacterial, and antihypertensive agent (Taoubi et al., 2000). Moreover, its roots are alternatives in treating malaria, rheumatism, and skin rashes (Chharba et al, 1999). Astutely, triterpenoids, flavonoids, alkaloids, and glycosides isolates of this plant are potential for diverse biological treatments (Sharma et al., 2000). Leaves extracts of *L. camara* contains larvicidal activity (Chavan & Nikam,

2000).On the other hand, flower extracts presents repellent activity against mosquitoes (Dua et al., 2003; Dua, et al., 2010). In the present study, both leaves and flowers of *L. camara* were tested for their repellent activities. Apropos of, mosquitoes had been one of the vectors of the world's pandemic health problem of serious human diseases that threaten human existence, e.g. zika virus, malaria, dengue fever, chikungunya, among others (Dua et al., 2010).

The crux is: the establishment of such botanicals in the management of insect pests has received more attention because it offers a more environmentally friendly and sustainable alternative to synthetic insect-pesticides that are available in the market nowadays from indigenous plant species. This investigation involves the use of the identified chemical entities in mediating with the deleterious mosquitoes that threatens human beings.

2. Materials and Methods

Design. This study employed the Completely Random Design (CRD) as its experimental units were essentially homogeneous with small number of treatments. Treatments were assigned to experimental units at random:

Treatment 1 – Young Leaves (These are the first four opened leaves from the terminal bud to the lower portion of the *L. camara* stalk. Leaves are of yellow green color.)

Treatment 2 – Matured Leaves (These are the fifth opened leaves from the terminal bud of *L. camara*. Leaves are of green to dark green color.)

Treatment 3 – Flowers (These are the opened flowers with white and pink colors).

Sample Preparation: Leaves and flowers of *L. camara* were collected from the field. Leaves and flowers were washed with distilled water to remove dust particles. Furthermore, they were air-dried and manually pulverized.

Test Mosquitoes: Laboratory colonies of a common mosquito were reared in a laboratory free of exposure to pathogens and insecticides. They were reared at STP at the Natural Science Laboratory of Quirino State University, Philippines. This ensured that the test mosquitoes were of the same species and of similar life state. Ten mosquitoes were subjected to the fume generated from the burnt *bangbangsit katol.*

Katol Preparation: Pulverized leaves and flowers of *L. camara* were mixed with corn starch. Corn starch served as the binder. The mixture was placed in a molder and baked in a microwave oven for 5 minutes.

Katol Efficacy Test: Ten mosquitoes were housed in a chamber and subjected with the fume of the developed *bangbangsit katol.* Number of dead mosquitoes was recorded at the end of five minutes exposure. Time of death (in seconds) was also recorded. Data were treated with ANOVA and Tukey simultaneous comparison.

3. Results and Discussion

Table 1. Number of Dead Mosquitoes Treated with *Bangbangsit Katol*[1]

	Treatment Conditions		
Replications	Young Leaves	Matured Leaves	Flower
1	6	10	8
2	7	7	9
3	8	7	8
4	7	8	10
Mean	7.00[a]	8.00[a]	8.75[a]
F-value: 3.08; p-value=.0958			

The number of dead mosquitoes in each treatment condition suggests that both leaves and flowers of *L. camara* are potential repellents to mosquitoes. The foregoing findings add to the existing findings on the uses of *L. camara*. Chava and Nikam (2000) stressed that leaves of *L. camara* are of larvicidal activity. On the other hand, flower extracts present repellent activity against mosquitoes (Dua et al., 2003; Dua, et al., 2010). The toxicity of this plant is attributed to a series of pentacyclic triterpenes which lantadenes A and B are typical members (Sharma et al., 2000; Khajja et al., 2011).

Table 2. Average Time of Death of Mosquitoes Treated with *Bangbangsit Katol*[1]

	Treatment Conditions		
Replications	Young Leaves	Matured Leaves	Flower
1	3.01	2.58	2.51
2	2.99	2.82	2.62
3	2.87	2.95	2.67
4	2.97	2.83	2.47
Mean	2.96[a]	2.795[ab]	2.568[b]
F-value: 12.74; p-value=.0024			

Results on the foregoing table suggest that both matured leaves and flowers of *L. camara* are of comparable efficiency on its repellent activities on mosquitoes. Lantanine, lancamarone, and lantadenes A and B, the offensive substances from *L. camara,* are known substances that attack and poison insect pests like mosquitoes (Begum et al., 2000; Sharma et al., 2000; Baidoo & Adam, 2010; Khajja et al., 2011).

Moreover, these findings contradict the findings of Chava and Nikam (2000), Dua et al. (2003), and Dua, et al. (2010). Chava and Nikam (2000) stressed that leaves of *L. camara* contain larvicidal activity. On the other hand, flower extracts present repellent activity (Dua et al., 2003; Dua, et al., 2010). Hence, it can be said that matured leaves also contain repellent activities aside from its known larvicidal activities.

[1] 1means of the same letter found in row are comparable at .05 level of significance
(Tukey simultaneous comparison t-values (df=9)

4. Conclusion and Future Works

Bangbangsit (L. camara) contains repellent activities aside from its known larvicidal activities. Offensive substances, like lantanine, lancamarone, and lantadenes A and B are found in the leaves and flowers of *L. camara.* These attack and poison insect pests like mosquitoes which can lead to their death. Therefore, *bangbangsit katol (L. camara)* is potential in treating deleterious mosquitoes.

The *bangbangsit katol* developed in this study may be optimized so it can be commercialized. Its commercialization is highly wanting as it is organic and it does not pose any harmful effect in the atmosphere unlike the synthetic mosquito repellents and sprays available in the market.

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