STUDY THE PREDATION RATE OF PREDATORY LARVA OF GENUS *LUTZIA* AT DIFFERENT PREY DENSITIES

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Introduction

Nowadays mosquitoes play a vital role as vector in disease transmission. Fewer than 150 species largely confine to *Anopheles, Aedes* and *Culex* is indirect cause of morbidity and mortality among human and other organism (Zhang and Shear, 2007). Therefore needs of mosquito control are essential and normally chemicals are used to control. Due to its deleterious health and environmental impacts, search for an environmentally friendly insecticide alternative has become a necessity and could be included in Integrated Vector Management (IVM) programs (Essam *et al.*, 2009). A few predacious mosquitoes are worthy of consideration at this stage. *Toxorhynchites* and *Lutzia* mosquitoes have obligatory predatory larvae and they have never been involved in disease transmission.

Genus *Lutzia* belongs to subfamily Culicinae and the larvae have been known as predators of mosquito larvae for a long time (Chow, 1972). The predatory mosquito *Lutzia* was earlier classified under sub genus *Culex Lutzia.* Presently it is classified as genus *Lutzia*. Now Sri Lanka faces dengue threatening and has experience in dengue. Hence the general objective of this study was to control the mosquito population by using the predator mosquito genus *Lutzia* as biological control agent. The specific objective is studying the feeding rate of predator larvae of *Lutzia* depend on the different density of prey.

Methodology

This study was conducted from February 2009 to March 2010. The field study was conducted at the Eastern University premises at Vantharumoolai. Plastic trays (29cm×24cm×6cm) with the capacity of 2500ml were used as artificial ovitraps for larval collection. Sample collection was done from natural ponds and artificial ovitraps in the study area. Adult, egg raft, larvae and pupae were collected in the study area. Fourty five plastic cups were filled with 70ml of filtered tap water. Then field collected healthy second/third instar of *Lutzia* larvae were placed in each cups individually and were starved for twenty four hours. Among fourty five cups ten same instar of *Culex* were placed into fifteen cups, and twenty larvae were placed into another fifteen cups and thirty larvae of *Culex* were placed into rest of the fifteen cups. Then the consumed prey larvae were counted every twenty four hours interval until all the predatory larvae pupated. The consumed prey larvae were replaced each time. In this experiment fifteen replicates were made every time.

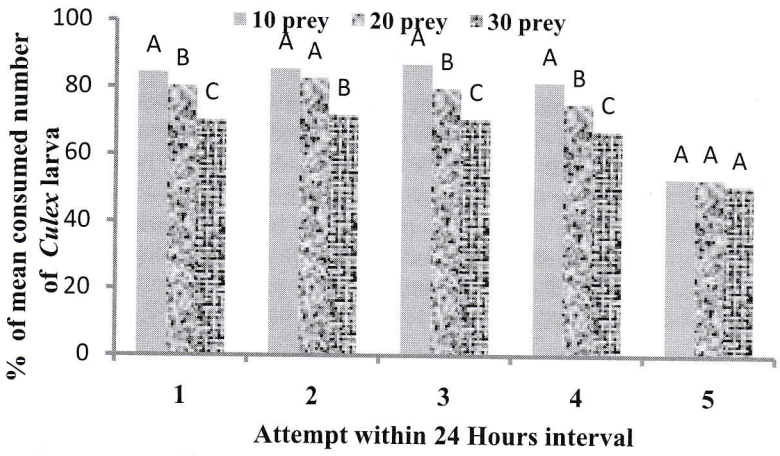
Data were analyzed statistically using statistical package SAS 9.0 and Minitab 14.0. The data were subjected to analysis of variance that is one way ANOVA for predation rate at different prey densities and the differences among means were considered significant at a probability level of five percent ($P \leq 0.05$).

Discussion and Conclusion

The results revealed that the percentage of consumed number of prey larvae decrease and left unconsumed increase with the increasing prey density as 10, 20 and 30 in prey density respectively. Figure 3.1 shows that the consumption pattern of *Lutzia* statistically significance ($p<0.05$) with hours and also statistically significance ($p<0.05$) with the

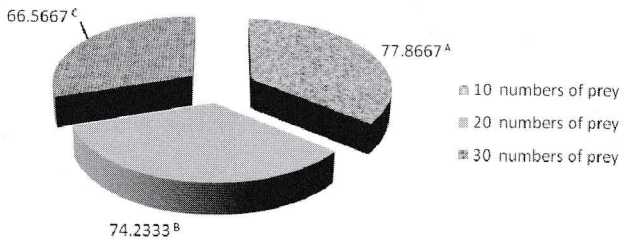
different densities of prey in the treatment. There is a statistical significance ($p<0.05$) between different densities of prey larva and hours. Figure 3.1 shows there is a significant different at first, third and fourth 24 hours of the interval in prey consumption between three different densities. Higher consumption percentage is in ten numbers of prey larvae of densities and decrease in 20 and 30 prey densities respectively. In last 24 hours there is no statistical significance between three densities of prey larvae. The consumption percentages are low compare to other twenty four hours of interval and low consumption percentage due to pre pupal stage.

If we concern about the total mean percentage of consumed number of prey larvae at different densities for succeeding of 5 days until the pupation there is a significant different between three prey densities (Figure 3.2). One larvae of *Lutzia* consumed 77.86% of same size of *Culex* larvae in density of ten number of prey from 2nd/3rd to pre pupation stage in laboratory condition. Likewise one larva consumed 74.23% and 66.42% of prey larvae in 20 and 30 number of prey densities.



**A, B and C denote the statistical significance*

Figure 3.1: Comparison of percentage of mean consumed number of *Culex* larva of different prey densities by *Lutzia* until the pupation of predator



A, B and C denote the statistical significance

Figure 3.2: Mean percentage of consumed number of prey at different prey density from the 2nd/3rd instar to pupation of predator

The predatory capacity of *Lutzia* is significantly influenced by changes in prey density. In this experiment volume of water was constant. With increasing prey density, the percentage of prey killed and left unconsumed increases (Prakash and Ponniah, 1977). The predation

capacity of *Lutzia* larvae under field condition was differ from that under laboratory conditions and it varies according to density of the prey larvae. In constant volume of water if the prey density was increased the movements of prey and predator are affected. This may affect the predation capacity of *Lutzia*.

The findings of this study were the predatory capacity of *Lutzia* is significantly influenced by changes in prey density. Predation rate were decreased in the increasing of prey densities.

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