

Mosquito Surveillance in the Brazos County (Diptera: Culicidae)

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Abstract: Mosquitoes are the most dangerous animals in the planet. They are known vector of some diseases like Malaria and Dengue. It is important to know what species of mosquitoes are presented in the area since not all of them vector the same diseases. The goals of this experiment was to identify the various species of Culicidae (Diptera) in the Bryan College Station area, in addition we noted the effect of climate on the prevalence of these species. Mosquito larvae were collected twice a week at three different locations. These collected larvae were separated into two groups- those to be maintained as larval specimens and those to be reared and identified as adults. By correctly identifying the adults, the potential to assert the most effective prevention methods for the Bryan College Station could potentially be achieved. In addition, studying the effects of climate on the population dynamics of mosquitoes can help determine the most efficient times to provide preventative treatments to the Bryan College Station area. This experiment will serve to identify the various species and the effects of climate on these species within the Bryan College Station area, in an effort to determine the most effective preventative measures.

Keywords: Mosquitoes, *Aedes*, weather, mosquito prevention

In the insect family Culicidae of the order Diptera, 3,500 species and 41 genera have been discovered and exist worldwide (Henning, 1998); with numerous species vectoring diseases including Malaria, Dengue Fever, and West Nile Virus, the research of mosquito life cycles and prevalence in the world has increasingly become a necessity (Gubler, 1998). Mosquitos are divided according to the habitat where they lay eggs, there are two major groups flood water species where eggs are laid in a habitat where bodies of water are temporarily full and

standing water species that lay eggs in bodies of water that are permanently filled (Crans, 2004). It is important to differentiate between the two because within each group they vector different diseases; furthermore it allows us to know what species to expect in a specific region based on the water availability of that area (Horsfall, 1956). It is important to know where important vectors of diseases like *aedes albopictus* (L.) (Diptera: Culicidae) are going to be located and if it is possible to encounter them in our area based on their habitat preferences (Juliano, 2001). In this study we

looked at several locations in the Bryan and College Station area of Texas for mosquitos including both flood water bodies like buckets and poorly drained residential backyards as well as permanent water bodies like several ponds. For several weeks samples were taken from these locations, Mosquito larvae were identified with several individuals reared to adulthood while the rest were persevered in alcohol. This project was primarily intended to give us insight into what species live in the Bryan and College Station area and in what substrates they live, but we also noted how weather factors affected egg hatching and larvae survival.

Materials and Methods

Collections took place at Texas A&M University's Research Park in College Station (30.602403 N,-96.359925 W), Lick Creek Park in College Station (30.564035 N,-96.213112 W), a neighborhood in Bryan (+30° 37' 51.1602"N-96° 23' 6.9606"W), and Wolf Pen Creek Park in College Station (30.613816 N,-96.324842 W). Texas A&M University's Research Park is an area with a standing man-made body of water, in addition to a natural flowing creek. Lick Creek Park is an area with a permanently standing body of water. The neighborhood in Bryan contains a man-made body of water. The final location has a backyard that is prone to flooding following rainfall. A water net (Walmart) and water cups (Walmart) were used to collect the larvae at each location .Sites were sampled 14 times

each. Adults were reared in a plastic container and a mosquito insect test breeder (Bioquip, Valencia, CA). Both larvae and adults were identified in a laboratory setting using a dissecting microscope and external light source. Various dichotomous keys were used to assist in proper identification.

Results

No larvae were collected on 12 out of 14 trips. One collecting trip in Lick Creek and one in the Bryan location were successful. 5 larvae were identified to be *Aedes aegypti*. All 34 reared out mosquitoes were *Aedes aegypti*. Our results are furthered illustrated on Table 1.

10 out of the 14 trips made had temperatures from 27 deg F to 35 deg. The two successful trips had temperatures of 75 deg F.

Table 1: Collection site and species of mosquitoes reared

Collection Site	Number of Mosquitoes Reared	Species of Mosquitoes
Lick Creek Park	31	<i>Aedes aegypti</i>
Wolf Pen Creek Park	0	N/A
Research Park	0	N/A
Bryan Location	3	<i>Aedes aegypti</i>

Discussion

Mosquitoes are the deadliest animal of the world thus understanding their lifestyle is important (Spielman, 2002). Understanding the habitat they live in allows us to know the probability of encountering one in our area thus allowing us to come with better control methods (Crans, 2004). Our results showed that the most common species of mosquitoes was *Aedes Aegypti*; we believe the weather affected our results. According to the National Weather Report, the average temperature from January to March was the lowest in almost 20 years. Mosquitoes prefer higher temperature; from 75- 80 deg F are ideal conditions for Mosquitoes to deposit

eggs (Eisen, et al. 2008). The conditions we were collecting were far from ideal since they were mostly in the 30 deg F. The fact that we only were available to rear out 33 mosquitoes from the same species collected from two out of all the collecting trips shows that the lower temperatures did have an effect on the mosquito prevalence of mosquito species in the area. Future studies should be conducted to further understand the complete effect of temperature in the development of mosquitos. Also further studies should be conducted on different times of the year to completely understand the effect of temperature and to really see what species is more prevalent in the area.

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