

# Seasonal Collection of Mosquitos in the College Station Area

Victoria Lozano, Anna Alvarez, Justin Pesek  
*Texas A&M University, Department of Entomology*

Edited by Rustin Pevehouse

---

**Abstract:** Mosquitos are a major concern as a vector of disease. Several potential mosquito breeding grounds in the College Station area were harvested for mosquito larvae present. The larvae collected were reared to adults in order to assist with identification. Several major vector species were found in the sample including *Culex restuans*, *Aedes aegypti*, *Psorophora confinnis*, and *Psorophora columbiae*. Disease spread by the feeding of these arthropods was shown to be a possibility.

*Keywords:* Culicidae, survey, environment

---

Mosquitos are the most lethal creation on earth due to being the vector of several fatal diseases (Mullen and Durden 2002). From the family Culicidae, these arthropods are holometabolous, progressing from the egg stage to a larval stage where they then pupate and emerge as adults. When choosing a site to lay eggs, the female mosquito must pay attention to the environment and be sure that water is prevalent. The larval stage of mosquitos is exclusively aquatic, requiring a body of water throughout the duration of the larval stage. One of the larger species *Psorophora*, is considered a transient flood type mosquito because of how they lay their eggs. While most other species lay an egg raft on the surface of water that is already present, this species lay their eggs in an environment that is prone to flooding where they then hatch in the presence of water. During the larval stage, the juvenile mosquitos shed their

cuticle four times with the amount of time in between being called an instar. As the larva grow larger, distinct variations in the structures visible occur (Mullen and Durden 2002). The features on the larvae that are altered between species are the respiratory siphon, anal segments, and head. By observing these areas, it is possible to begin to distinguish the species of the larva. The majority of adult female mosquitoes are anautogenous, requiring a blood meal to initiate vitellogenesis, which is the method through which the yolk is formed, during egg development (Martin, Piulachs, and Raikhel 2001). It is this blood feeding which makes mosquitos efficient vectors in the transmission of diseases such as malaria, lymphatic filariasis, yellow fever, and West Nile Virus. The latter disease has recently become endemic in Texas, with the first reported case in 2002 and repeated cases in

subsequent years (Nolan, Schuermann, and Murray 2013). To better understand the risk of disease in the College Station area, an accurate representation of the species present was necessary.

## Materials and Methods

To collect larva, a large aquatic net (Bioquip # 7338AR; 2321 Gladwick Street, Rancho Dominguez, CA 90220) was swept through bodies of water to be tested. The larvae collected were then kept in glass jars (Walmart; 702 Southwest, Bentonville, Arkansas 72716) with three quarters of the jar filled with water from the environment. Empty soda bottles (Coke; 1 Coca-Cola Plaza, Atlanta, Georgia 30313) and a mosquito breeder (Bioquip #1425; 2321 Gladwick Street, Rancho Dominguez, CA 90220) were used to rear adult mosquitos. To identify the mosquito larvae, the specimens were placed in a petri dish (Bioquip #6187; 2321 Gladwick Street, Rancho Dominguez, CA 90220) filled with ethanol and viewed under a dissecting microscope. For the identification of the adult mosquitoes, a dissecting microscope was used and the

specimens were point-mounted. The sites that were observed are described in Figure 1 below. Figure 2 shows the locations on a map of the Bryan-College Station area.

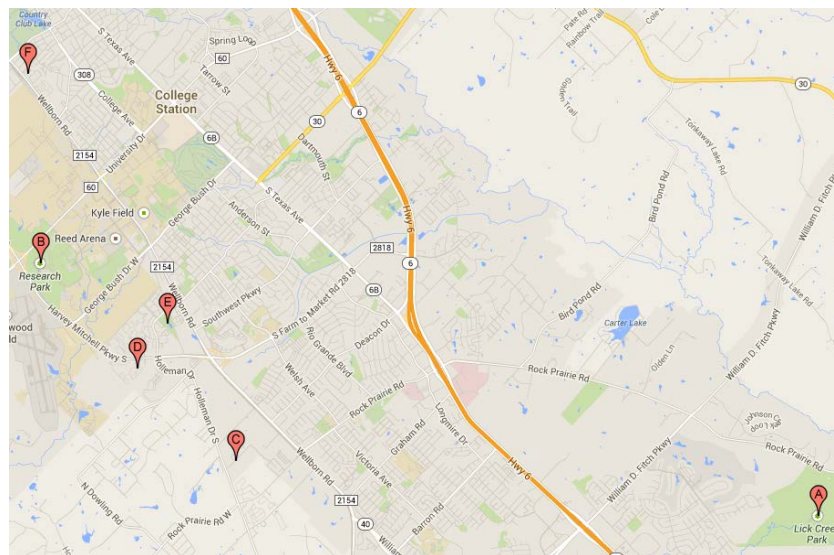
## Results

The overall results of collection are summarized in Figure 3. Species collected at the various sites included *Aedes vexans*, *Aedes aegypti*, *Psorophora confinnis*, *Psorophora columbiae*, and *Culex restuans*. At several locations, no mosquito larvae were found. At the South Hampton Court location a bucket of water had been placed outside to collect larvae however it had been emptied upon being checked. Many other locations had no sign of mosquito larva. Several places had an oily sheen on the surface of the water which could have potentially been a control substance. In addition, mosquito growth this season may have been inhibited by atypical weather conditions at the locations in early spring. Several overnight freezes occurred from January through March, when temperatures are usually rising.

**Table 2:** Weather data during period of study observation. Collection dates highlighted in yellow.

Letter	Observed Location	Coordinates
A	Lick Creek Park, College Station, TX	30°33'40.0''N 96°12'49.7''W
B	Research Park, College Station, TX	30°36'11.2''N 96°21'35.36''W
C	The Barracks at Rock Prairie, College Station, TX	30°34'12.2''N 96°19'24.0''W
D	2818 Place Apartments, College Station, TX	30°35'09.1''N 96°20'22.7''W
E	John Crompton Park, College Station, TX	30°35'29.4''N 96°20'11.4''W
F	South Hampton Court, Bryan, TX	30°37'59.8''N 96°21'42.1''W

**Figure 1.** Letters A-F represents the locations observed for the collection of mosquitoes and contain precise latitude and longitudinal locations.



**Figure 2.** Map representing the six locations observed for mosquito

Date	Time	Location	Species Name	Number Collected
<b>22 March, 2014</b>	7:30 pm	Lick Creek Park	<i>Aedes vexans</i>	1 Adult 1 Larvae
<b>23 March, 2014</b>	3:00pm	Research Park	None	None
<b>25 March, 2014</b>	5:35pm	Research Park	None	None
<b>30 March, 2014</b>	3:30pm	Research Park	None	None
<b>2 April, 2014</b>	7:00pm	John Crompton Park	None	None
<b>5 April, 2014</b>	5:00pm	South Hampton Court	None	None
<b>6 April, 2014</b>	4:00pm	Research Park	None	None
<b>6 April, 2014</b>	5:00pm	2818 Place Apartments	None	None
<b>9 April, 2014</b>	7:00pm	John Crompton Park	None	None
<b>12 April, 2014</b>	5:00pm	South Hampton Court	None	None
<b>16 April, 2014</b>	7:00pm	John Crompton Park	None	None
<b>20 April, 2014</b>	2:00pm	2818 Place Apartments	<i>Aedes aegypti</i>	1 Larvae
			<i>Aedes vexans</i>	5 Larvae
			<i>Psorophora confinnis</i>	1 Larvae
<b>20 April, 2014</b>	4:30pm	The Barracks at Rock Prairie	<i>Culex restuans</i>	3 Adults (2 males and 1 female)
			<i>Psorophora columbiae</i>	2 Larvae
<b>20 April, 2014</b>	6:15pm	Lick Creek Park	<i>Culex restuans</i>	4 Larvae

**Figure 3.** Specimens collected.

## Discussion

Collection at various sites in the Bryan-College Station area yielded several mosquito species which are known vectors for several diseases. *Culex restuans* is a critical vector for West Nile Virus, especially in the early spring transmission period (Fonseca, Okada, and Kramer 2009). The genus *Psorophora* has been shown to vector Venezuelan Equine Encephalitis (Morrison, Forshey, Notyce, et. Al 2008). *Aedes aegypti* might possibly be the most well-known vector collected; transmitting several dengue serotypes and yellow fever (Carrington, Seifert, Armijos, Lambrechts, and Scott 2013). *Aedes vexans* is the only taxa collected which has not been definitively proven as a major vector of disease. While these species were present in small numbers, it is possible

many more had either been exterminated through control or were allowed to hatch into adults. The Bryan-College Station area contains many potential habitats for breeding of mosquito larva which could lead to an outbreak of the diseases these species are a known vector of. The most of alarming of which may be *C. restuans* which is a known vector of West Nile Virus, a disease which has been endemic to Texas since 2002. Now that the area has been surveyed, the local health department might be able to more accurately decide how to control these vector species and lower the risk off illness throughout the population

## References

- Carrington LB, Seifert SN, Armijos MV, Lambrechts L, Scott TW (2013)** Reduction of *Aedes aegypti* Vector Competence for Dengue Virus under Large Temperature Fluctuations. *Am J Trop Med Hyg* 2013; 88(4): 689-697
- Fonseca DM, Okada K, and Kramer LD (2009)** Microsatellite loci for the white-dotted mosquito *Culex restuans*, a principal vector of West Nile virus in North America. *Molecular Ecology Resources*, 9(3), 958-960
- Foster, W.A. and Walker, E.D. (2002).** Mosquitoes (Culicidae), pp. 203-262. In G. Mullen and L. Durden [eds.] *Medical and Veterinary Entomology*. Academic Press, Burlington MA.
- Martin D, Piulachs MD, Raikhel AS (2001)** A Novel GATA Factor Transcriptionally Represses Yolk Protein Precursor Genes in the Mosquito *Aedes aegypti* via Interaction with the CtBP Corepressor. *Mol. Cell. Biol.* Jan. 2001; 21(1): 164-174
- Morrison AC, Forshey BM, Notyce D (2008)** Venezuelan Equine Encephalitis Virus in Iquitos, Peru: Urban Transmission of a Sylvatic Strain. *PLoS Negl Trop Dis.* Dec 2008; 2(12): e349
- Nolan MS, Schuermann J, Murray KO (2013)** West Nile Virus Infection among Humans, Texas, USA, 2002-2011. *Emerg Infect Dis.* Jan 2013; 19(1): 137–139