TEXAS MOSQUITO CONTROL ASSOCIATION NEWSLETTER

Volume 43	August	2023

Sunset in Hebbronville, Texas

Editor – William Sames

Contributors – James Garcia, Nina Dacko

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About the Cover: It was about 8:45 pm, when Bill Sames and Ray Dunton set the last mosquito trap for the day and were walking back to the truck through mesquite, prickly pear, and huisache. Bill captured this image to end a full day of mosquito collecting in Jim Wells, Duval, and Jim Hogg counties. Temperatures exceeded 100^{o}F and humidity was not far behind. This photo was taken just outside of Hebbronville.

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James Garcia

Message from the President
James Garcia

Ah, fall is almost here, and I suspect that most are looking forward to the cooler weather and the decrease in mosquito populations. Since my last communication, there has been one case of locally transmitted malaria in the Rio Grande Valley. No official reports have been released, but it looks like the local mosquito and vector control groups got it stopped. That's a good thing because we don't need mosquito-borne diseases affecting our citizens. Then there is thing called rain, which we seem to have had in short supply over the past decade or so. It would be great to have some, but of course, that might generate mosquito control work. At this point, I think most would be willing to trade plentiful rain for some extra work. That water is needed by us and so many other life forms.

Fall also brings something that I really enjoy and that is the TMCA Annual Meeting. This year, we return to the Embassy Suites Hotel in Corpus Christi on November 1-3. The TMCA held its 2016 meeting at this location, which seemed to be well received by those who attended. On the TMCA website, the hotel, meeting, and vendor registration are up and running. Very soon, the Call for Papers, and applications for scholarships and awards will be posted. There are some deadlines that must be met for each, so go to Fall Meeting | Texas Mosquito Control Association and check them out. There may be some information left from last year on the webpage, and we are working to find and clear those postings, so make sure you are registering for the 2023 meeting in Corpus Christi. The TMCA Annual Meeting is a great opportunity to network with others in the mosquito surveillance and control profession, learn about new equipment and products, listen to presentations about what others are doing in their operations, and enjoy being around others who do the same thing that you do. I hope to see you there!

Wanted: TMCA Newsletter Editor

If you are interested in becoming the next Editor of the TMCA newsletter, please contact William Sames at mosquitodoctor@yahoo.com. William will continue to serve as Editor until replaced OR until December 31, 2023, whichever comes first. Since 2001, William Sames has served over 9 years as Editor or Assistant Editor of the TMCA Newsletter, and he is ready to give someone else the opportunity to release their creativity and take over the responsibilities of this publication.

Wanted: TMCA Website Manager or Assistant Manager.

Corey Steele, the current website manager, was promoted at Harris County and needs help with the input to the website. If you are interested in helping him, please contact him at corey.steele@phs.hctx.net.

TMCA Administrative Notes

Publishing in the TMCA Newsletter. The TMCA newsletter is a medium for getting information to TMCA members and content may be from TMCA officers and members. If you have information of benefit to TMCA members, please submit that information to the TMCA Editor. Newsletters are published in January, May, August, and November. Photos are also welcome. Consider submitting artwork or photos for a cover.

Advertise in the TMCA Newsletter. Advertising rates are $50 for 8.5 x 11 inches page ad. Half page ads are $30 (8.5 x 5.5) Submit copy ready artwork in MS Word or PDF to the TMCA Editor.

2023 TMCA Annual Meeting. The TMCA Annual Meeting will be November 1-3, 2023, at the Embassy Suites Hotel in Corpus Christi. The TMCA met at this great venue in 2016, so we are back! Registration, a schedule of events, a Call for Papers, Scholarship and Award Information, and how to make reservations are posted on the TMCA website, Fall Meeting | Texas Mosquito Control Association. General information is also in this newsletter.

2024 American Mosquito Control Association Annual Meeting. The AMCA Annual Meeting is scheduled for March 4-8, 2024, at the Sheraton Convention Center in Dallas, Texas.

2024 TMCA Spring Workshop. The TMCA with Texas AgriLife will hold its Spring Workshop April 9-10, 2024, at the Hilton Garden Inn, Tyler, TX.

Membership in TMCA Committees

Interested in serving on a TMCA Committee? If yes, you may contact the Committee Chair **OR** go to the TMCA website and sign up online at https://www.texasmosquito.org/membership-and-committees. To join a committee, send a request to info@texasmosquito.org.

Note from Salvador Rico. We welcome all who would like to assist TMCA in becoming the best Mosquito & Vector organization around. Our Association is only as good as our members are and want to become. If you feel like coming on board and helping us to continue our journey moving positively forward, then we urge you to get involved. Some positions are either open or coming open at TMCA. Though we are non-profit and raise funds for scholarships and select sites for networking locations our volunteers are the backbone of our organization in helping/educating the public about Mosquitoes/vectors and their control. If you'd like to be considered to become a future board member or head or be a part of a committee…contact us or talk to committee chairs at the annual meeting. Make a difference and let's help our residents of the Great State of Texas!

The Economic Cost of Mosquito Resistance

Originally published in the
August 2022 edition of Public Health Landscape
www.publichealthlandscape.com

To account for the full economic impact of mosquito resistance, one must layer in the amount being spent on insect management and how much of that investment is lost to resistance, but also the economic impact of losses to the overarching objectives of a given program.

To calculate the impact, you must first calculate what is at risk.

According to the World Health Organization (WHO), vector borne diseases account for 17% of all infectious disease and more than 700,000 deaths annually. In this context; we research, analyze, and report on outbreak events and may consider the impact of resistance through that lens.

To do so, we must also account for variability between local and regional infrastructures, strategic and operational approaches to vector control, available technologies, the social and political climate of the areas affected, as well as surveillance activities and the quality of data coming from reporting systems, if any.

Extend this view to cross all geographies and vector borne diseases, and the complexity of calculations quickly becomes mind numbing. However, there is a simpler way to think about resistance that is even more pressing.

What is the cost of resistance when faced with a future (or imminent) epidemiological event?

What is the incremental cost of having to rely on tools that are somewhat, but not entirely ineffective?

Costs that manifest not only as dollars but also quality of life. Since the overarching objective of vector control is reducing the incidence of vector-borne disease, then any impacts of insecticide resistance on disease burden must be considered.

 Content sponsored by Valent BioSciences.

Local Transmission of Malaria in the Rio Grande Valley, 2023

by William Sames

One case of locally acquired malaria was reported in Cameron County on June 7, 2023. Detailed information about this case was released on September 8, 2023, and is available online (Blackburn et al. 2023). A hospital requested assistance from the Centers for Disease Control and Prevention on the identification of a potential locally acquired case of malaria. The CDC identified it as *Plasmodium vivax*, and notified the Texas Department of State Health Services, which initiated interagency action to mitigate this disease threat (Blackburn et al. 2023). This article is meant to be a short primer to bring you up to speed on malaria and how it is acquired, treated, and prevented.

First, notice the words “local transmission” used in the title of this article. Public health discussions about diseases may involve the words local or travel transmission. If a person acquires a non-endemic mosquito-borne disease without leaving their hometown or general area, then the disease is termed locally transmitted.

Travel transmission means that a person travelled to a location where a disease is endemic and brought it back in their body when they returned. For example, a person may go on a safari to Africa and acquire malaria, and the disease may not express itself until they return. Fortunately, we have a good public health system, so most people go see a doctor when they are severely ill. Doctors should ask a person about their travel history as part of their investigation into the cause of the illness. Doctors who hear that their patient travelled in the past weeks or month to an area known to harbor mosquito borne diseases should consider the possibility that the person acquired the disease at that location and brought it home with them.

Endemic disease is one that is in the region where a person lives. For example, West Nile virus originated in Africa but spread to other parts of the world and became established. In 2002, the disease was found in Texas and will probably be here for a long time. Prior to 2002, it was a non-endemic disease (not present in Texas) and after 2002, it became an endemic disease, because it is here and expected to recur on a regular basis. Public health officials anticipate the presence of endemic diseases and take action to prevent them. Endemic mosquito borne diseases in Texas include West Nile virus, St. Louis encephalitis, and Eastern equine encephalitis. There are others, but these are the main three.

For disease transmission to occur all of the following must happen, the disease agent must be present, the right vector must be present, there must be a reservoir (has disease agent in their body), and there must be a susceptible host (an animal that can receive and express the disease). That means that the right vector mosquito was able to acquire the disease agent from an infective reservoir (a person or animal which had the disease replicating in their body). The disease agent then replicated in the vector, which transferred the disease agent to a susceptible host. The susceptible host then expressed symptoms of the disease or in many cases was asymptomatic (had the disease without symptoms).

Malaria is a parasite in the genus *Plasmodium*, and it is transmitted by some mosquito species in the genus *Anopheles*. There are over 200 *Plasmodium* species that are specific to the range of animals that it parasitizes. The 4 *Plasmodium* species that affect humans are *P. falciparum*, *P. vivax*, *P. malariae*, and *P. ovale*. The parasite changes form (different names of each stage) as it progresses through the reservoir, vector, and host. Learn more about the malaria parasite life cycle here: CDC - Malaria - About Malaria - Biology.

The Mayo Clinic says that signs and symptoms of malaria may include:

- Fever
- Chills
- General feeling of discomfort
- Headache
- Nausea and vomiting
- Diarrhea
- Abdominal pain
- Muscle or joint pain
- Fatigue
- Rapid breathing
- Rapid heart rate
- Cough

Some people who have malaria experience cycles of malaria "attacks." An attack usually starts with shivering and chills, followed by a high fever, followed by sweating and a return to normal temperature.

Malaria signs and symptoms typically begin within a few weeks after being bitten by an infected mosquito. However, some types of malaria parasites can lie dormant in your body for up to a year (End of Mayo Clinic online).

Malaria prevention is like prevention of other mosquito borne diseases and recommendations can be easily looked up on the internet. Similarly, control is similar as the same equipment and pesticides are used. The larval habitats may be slightly different, so conduct surveillance to locate sites where large numbers of *Anopheles* species of concern are developing and treat those sites following label recommendations. Anophelines are nocturnal so adulticiding would follow protocols established for other nocturnal species of interest like *Culex quinquefasciatus*.

Historically, malaria used to kill hundreds and sometimes thousands of Texans every year. Searching the Texas State Historical Association's website using "malaria" as a parameter will generate numerous short stories about how malaria affected early Texas. For *Public Health Reports* from the early 1900s, search for the author "Faust." He published annual malaria summaries for the US for about 20-25 years.

Before 1900, no one knew how malaria was transmitted and most doctors did not have diagnostic testing. So, they looked at symptoms and made their best call as to the disease. Diagnostic accuracy was not near 100%, and there was no telling how many people died since their death or cause of death may not have been recorded. While projections are based on educated estimations of best available documentation, they give us an idea of the severity of malaria in early Texas.

In 1900, the Walter Reed Commission demonstrated that Yellow Fever was vectored by *Aedes aegypti* and a short time thereafter, other diseases like malaria were attributed to mosquitoes as being the vectors. In the early 1900s, malaria eradication programs began, and endemic malaria was eradicated from Texas and the rest of the continental US in the 1950s. After eradication of malaria from Texas, local malaria transmission in Texas occurred in 1970, 1971, 1985, 1994, along with 2 induced cases via a blood transfusion in August 1992 (MMWR 1995, Zucker 1996, Zucker et al. 1995).

Fortunately, we live in a state/country where there is an emphasis on vector-borne disease prevention. For the May-June malaria case in the Rio Grande Valley, public health authorities responded to the situation with surveillance and control measures, and at this time, no other human cases or positive mosquito samples have been found. Following best practices for mosquito surveillance and control will help prevent or mitigate local transmission of non-endemic mosquito-borne diseases.

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AMCA Washington Day – May 2023

Nina Dacko

As with past years, I had the pleasure of attending the AMCA's Washington Day Event in our nation's capital, Washington DC. In previous years, I focused on helping educate our members in congress about the importance of our industry and advocate for mosquito control from a local level. This year I was representing the Texas Mosquito Control Association (TMCA) and the American Mosquito Control Association (AMCA) as a subject matter expert and as the Chair for the Control Strategies Subcommittee.

The AMCA representatives were invited to a meeting at the Environmental Protection Agency (EPA) headquarters. Attendees from the AMCA included, Ms. Angela Beehler and Dr. Mark Clifton (Legislative and Regulatory Co-Chairs), Dr. Dan Markowski (AMCA Technical Advisor), Mr. David Brown (AMCA Special Project Coordinator), Mr. Gary Goodman (Federal Funding Subcommittee Chair), Mr. Paul Whatling (FMC Senior Global Regulatory Technical Manager), Dr. Chris Barker (Professor, UC Davis and Team Lead for VectorSurv), Mr. Ed Ruckert (AMCA Legal Counsel), and the Endangered Species Act (ESA) Subcommittee Chair, Mr. Daniel Killingsworth. This AMCA representation was from several regions, including the states of California, Washington, Illinois, Texas, and Florida, as well as a representative from the pesticide industry regarding the registration process and upcoming ESA requirements.

From left, Nina Dacko, Dan Markowski, Dan Killingsworth, Dave Brown, and Mark Clifton.

Representing the industry and nation is important as regional environmental conditions vary and each region may face different issues and may cause differences in the performance mosquito control. We met with representatives from US Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), EPA, and others to discuss the upcoming proposed changes on EPA pesticide labeling.

Dr. Markowski, Mr. Brown, and Dr. Barker included short presentations about the AMCA, upcoming concerns about labeling requirements and deposition studies, and a demonstration of VectorSurv as a potential solution for data collection desired from these agencies.

Angela Beehler and Paul Whatling in front of the EPA building.

A question did arise regarding data from Texas and how the Texas Department of Agriculture (TDA) might be able to collect and share data about pesticide applications. It was mentioned that the Texas Department of State Health Services (DSHS) had interest in utilizing VectorSurv for surveillance data and that this idea could be floated to TDA for gathering data about pesticide usage from around the state. Without this data, federal regulatory agencies will assume pesticide applications are occurring in <u>all</u> places of a mosquito control agencies boundary rather than the limited areas where applications are actually taking place due to appropriate surveillance. Without this targeted pesticide application information, federal agencies could make unwarranted and unnecessary label mitigations to protect endangered species.

The AMCA Legislative and Regulatory Committee held a strategic planning workshop the following day. There we brainstormed about upcoming legislative and regulatory goals, and how we might accomplish them, about the future of AMCA committee structures, and about the needs for AMCA outreach and networking with appropriately affiliated associations. These goals are being reviewed by the AMCA Board of Directors who will help streamline the future focus of our Legislative and Regulatory Committee.

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TMCA Prepares for the 2024 AMCA Annual Meeting in Dallas

The 2024 American Mosquito Control Association Annual Meeting will be in Dallas, Texas, March 4-8, 2024 at the Sheraton Dallas Hotel. It will be here before you know it!

The TMCA has host responsibilities associated with supporting this event. These responsibilities will be forthcoming in April or May as the AMCA contracts with the TMCA. There will be plenty of opportunities for your involvement. Meanwhile, mark your calendar for these dates and make plans to be there. Stay tuned for more information!

Sheraton Dallas Hotel

In early March, several TMCA members attended the AMCA Annual Meeting in Reno, NV. While there, they promoted the Dallas meeting, asked questions, and got ideas on what and how we can do things next year. I look forward to hearing their lessons-learned in the coming months.

Meanwhile, here are some things that will be done in support of the meeting.

The TMCA will establish a Local Arrangements Committee to organize TMCA volunteers.

Volunteers will man a 10 x 10 booth in the Exhibit Hall to answer questions about the meeting, Texas, and the TMCA. Some needed each day.

Volunteers will help at the AMCA Registration desk. Some needed each day.

Volunteers needed in the speaker ready room as aides and session room aides. Some needed each day.

Volunteers needed to check badges as people entered the exhibit hall, banquet, and other venues. Some are needed for the event only.

Volunteers (up to 20) will receive free registration to this meeting. A good savings!

Dr. Sonja Swiger will organize the volunteers for this event. If you plan to attend this meeting, which I recommend, plan to volunteer. Contact Dr. Swiger and let her know of your interest in volunteering for this event. Plan to be there! Volunteer! It will be fun!

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2023 Mosquito-Borne Disease Summary

Below are selected pages from the latest 2023 mosquito-borne disease summary from the Texas Department of State Health Services. To see the full summary or other weekly reports, please visit the DSHS website at [DSHS Arbovirus Weekly Activity Reports | Texas DSHS]. From this page you can access previous years' summaries and compare them to 2023. These may be useful in planning your program's activities this year.

TEXAS Health and Human Services | Texas Department of State Health Services

2023 DSHS Arbovirus Activity Report
Week #34 (ending August 26, 2023)
Report Date: August 29, 2023

Table 1. 2023 Arbovirus Activity Summary, Texas, Week 34

Arbovirus	Mosquito Pools	Avian	Veterinary	Sentinel Chicken	Human					
					Febrile Illness	Neurologic Illness	Severe Dengue	TOTAL (HUMAN)	Deaths	PVD[2]
California Serogroup[1]								0		
Chikungunya								0		
Dengue					3		1	4		
Eastern Equine Encephalitis								0		
St. Louis Encephalitis	2			1				0		
West Nile	634		4		6	20		26	1	20
Zika								0		
TOTAL REPORTS	636	0	4	1	9	20	1	30	1	20

[1]California Serogroup includes California encephalitis, Jamestown Canyon, Keystone, La Crosse, snowshoe hare, and trivittatus viruses.
[2]PVD - Presumptive viremic blood donors are people who had no symptoms at the time of donating blood through a blood collection agency, but whose blood tested positive when screened for the presence of West Nile virus or Zika virus. Unless they meet the case reporting criteria, they are not counted as a case for official reporting purposes and are not included in the "Total (HUMAN)" column.

Note: Human mortality from arboviral conditions is aggregated and reported monthly once documentation has been received and verified.
For more detailed information about West Nile virus, including past weekly and annual reports, please visit https://www.dshs.texas.gov/mosquito-borne-diseases/dshs-arbovirus-weekly-activity-reports
For more detailed information about Zika, please visit http://www.texaszika.org/

Table 2. 2023 *Aedes*-Associated Arbovirus Activity by County†, Week 34

County	CHIKV		DENV		ZIKV		
	M	H	M	H	M	H	PVD
Dallas*				2			
Montgomery				1			
Tarrant				1			
Total Number of Reports	0	0	0	4	0	0	0

M- mosquito H- human PVD- Presumptive viremic blood donors
CHIKV - Chikungunya Virus
DENV - Dengue Virus
ZIKV - Zika Virus
* One case acquired by mosquito transmission in Val Verde County
†County level data is not reported for conditions with <5 cases reported in a year.

Note: Very interesting data on the travel case of Dengue Fever in Dallas County. It was acquired within Texas (Del Rio, Val Verde County). That makes the control of *Aedes aegypti*, the primary vector of Dengue Fever, an important part of your program especially if you live in Texas-Mexico border counties.

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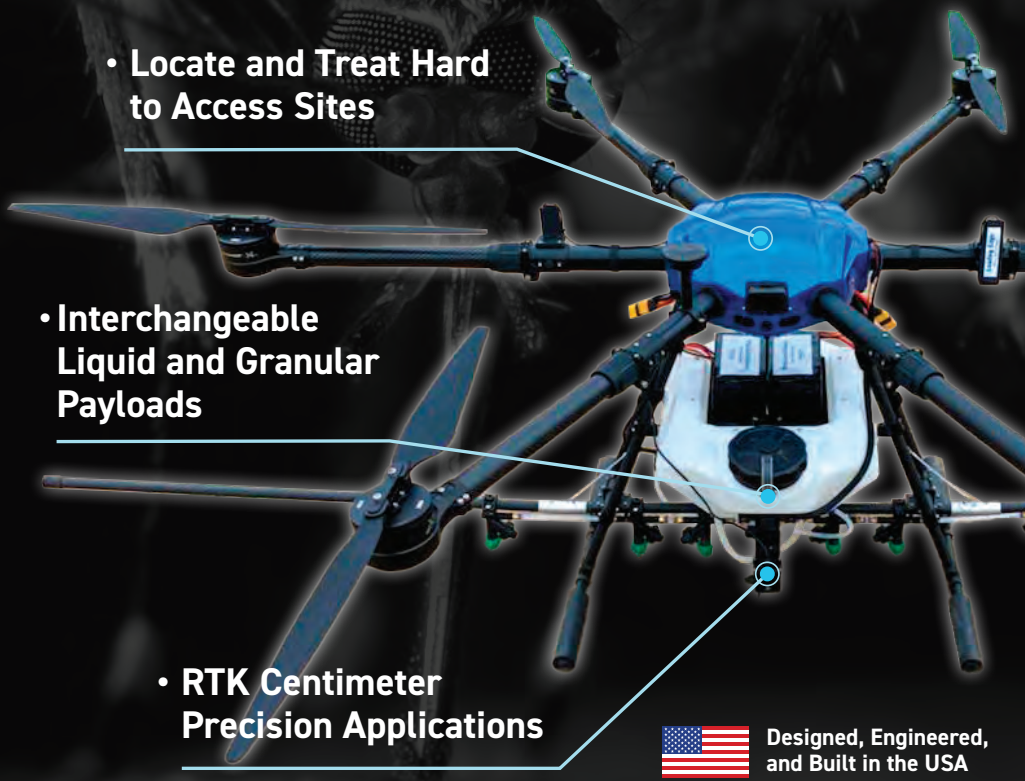

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TMCA Annual Meeting – November 1-3, 2023

Location: Embassy Suites Hotel, 4337 S Padre Island Dr, Corpus Christi, TX 78411; 361-853-7899

Registration is on the TMCA website: Fall Meeting | Texas Mosquito Control Association

Call for Papers to be online by September 5th. The deadline to submit the presentation is October 20th.

Scholarship and Award Information to be online by September 5th. The deadline to submit scholarship applications or award nominations is October 20th.

TEXAS MOSQUITO CONTROL ASSOCIATION
Program for the 65th Annual Meeting
Embassy Suites Hotel, Corpus Christi, TX

Tentative Program

WEDNESDAY, 1 NOVEMBER 2023

Noon-5:00 pm	Registration and Exhibitors Set-up
5:00-7:00 pm	Early Bird Social (Includes Food!)
7:30-10:30 pm	TMCA Board of Directors Meeting

THURSDAY, 2 NOVEMBER 2023

7:00 am-5:00 pm	Registration
7:00-8:30 am	Breakfast
7:00-8:30 am	Exhibitors Set-Up
8:30 am-5:00 pm	Exhibits Open
8:30-10:00 am	GENERAL SESSION A
8:30 am	Call to Order: James (Jimmy) Garcia'
10:00-10:30 am	Coffee Beak-Exhibit Area
10:30-11:30 am	GENERAL SESSION B Inspection and Control
11:30 am-12:00 pm	SESSION C VENDOR INTRODUCTIONS
12:10-1:09 pm	TMCA LUNCHEON for meeting registrants
1:10-2:20 pm	GENERAL SESSION D Student Competition and Scholarships
2:20-2:50 pm	Coffee Break- EXHIBIT AREA
2:51-5:00 pm	GENERAL SESSION E Education and Programs

FRIDAY, 3 NOVEMBER 2023

7:00 - 8:30 am	Breakfast
8:30 - 9:30	GENERAL SESSION F Academic and Research Coffee Break (Exhibit Area)
9:30- 9:59 am	Coffee Break (Exhibit Area)
10:00 - 12:00	General Session G Enhancing Mosquito Control Capacity for Response to Natural Disasters

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Local Representative:
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Mosquito Species in Texas
(88 species as of September 8, 2023)

Aedes aegypti
Ae. albopictus
Ae. atlanticus
Ae. bimaculatus
Ae. brelandi
Ae. campestris
Ae. canadensis
Ae. dorsalis
Ae. dupreei
Ae. epactius
Ae. pallens
Ae. grossbecki
Ae. hendersoni
Ae. infirmatus
Ae. japonicus
Ae. mitchellae
Ae. muelleri
Ae. nigromaculis
Ae. scapularis
Ae. sollicitans
Ae. sticticus
Ae. taeniorhynchus
Ae. thelcter
Ae. thibaulti
Ae. tormentor
Ae. triseriatus
Ae. trivittatus
Ae. vexans
Ae. zoosophus

Anopheles albimanus
An. atropos
An. barberi
An. bradleyi
An. crucians
An. franciscanus
An. freeborni
An. judithae
An. psuedopunctipennis
An. punctipennis
An. quadrimaculatus
An. smaragdinus
An. walkeri

Coquillettidia perturbans

Culex abominator
Cx. apicalis
Cx. arizonensis
Cx. chidesteri
Cx. coronator
Cx. declarator
Cx. erraticus
Cx. erythrothorax
Cx. interrogator
Cx. nigripalpus
Cx. peccator
Cx. pilosus
Cx. quinquefasciatus
Cx. restuans
Cx. salinarius
Cx. stigmatosoma
Cx. tarsalis
Cx. territans
Cx. thriambus

Culiseta incidens
Cs. inornata
Cs. melanura

Deinocerites mathesoni
De. pseudes

Haemagogus equinus

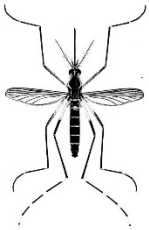
Mansonia titillans

Orthopodomyia alba
Or. kummi
Or. signifera

Psorophora ciliata
Ps. columbiae
Ps. cyanescens
Ps. discolor
Ps. ferox
Ps. horrida
Ps. howardii
Ps. longipalpus
Ps. mathesoni
Ps. mexicana
Ps. signipennis

Toxorhynchites moctezuma
Tx. septentrionalis

Uranotaenia lowii
Ur. sapphirina
Ur. syntheta



This list was created by the TMCA Mosquito Systematics, Identification, and Biology Committee:

Dr. William Sames, Chair
(Indep. Researcher, US Army (retired))

Dr. Bethany Bolling
(Texas Dept. of State Health Services)

Dr. Rick Duhrkopf
(Baylor University, retired)

Dr. Jeff Flosi
(University of Houston, retired)

This list includes changes from:

Harbach RE, Wilkerson RC. 2021. The insupportable validity of mosquito subspecies (Diptera: Culicidae) and their exclusion from culicid classification. Zootaxa 5303:1-184.

Texas Mosquito Control Association
Membership Application

Purpose: To assist in promoting public health and comfort through the control of disease transmitting and pestiferous mosquitoes, to provide for the scientific advancement of Association members, and to stimulate public interest in mosquito control activities.

Publications: A Newsletter is published quarterly and emailed to active members. The Association web site is located at **http://www.texasmosquito.org**

TMCA Annual Fall Meeting: Held in October at an announced site within the state. Papers presented at this meeting are primarily technical reports dealing with new and improved methods of mosquito control, new insecticides, and application techniques. Basic research related to mosquito life cycles, bionomics, diseases, and natural histories are also presented. Distributors display and answer questions about their equipment and chemicals. A registration fee is required to attend.

TMCA Spring Workshop: Held each year during February, March, or April at an announced site within the state. This is a basic training workshop on the operational aspects of mosquito control. Topics include general mosquito biology, mosquito borne diseases, sampling and surveillance techniques, methods of mosquito control, public relations, equipment maintenance, chemicals and chemical safety, record keeping, administrative problems, and advanced operational training in calibration, droplet size determination, mosquito identification, and surveillance devices and techniques. Distributors are present to display and demonstrate their products. Registration is free, and several meals are usually provided by the TMCA to help reduce costs to attendees.

CEU's: CEU's for the Texas Department of Health Vector Control Certified Applicator License are offered at the Spring Workshop. Fees are $20 per hour of CEU requested for non-members, free to all TMCA members. A copy of the TDA regulations can be downloaded from the TMCA web site at **http://www.texasmosquito.org**

Annual Dues: Dues are payable on a calendar year basis. Active Memberships are $30 per year, and Supporting Memberships are $60 per year.

Name: _____ Date: _____

Affiliation: _____ Position: _____

Work Mailing Address: _____

City & State: _____ Zip: _____

Phone: _____ Fax: _____ Email: _____

Membership type applied for: Active ($30): _____ Sustaining ($60): _____

Make check payable to: Texas Mosquito Control Association

Return application & remittance to:

Dr. Mark Johnsen,
Chair, TMCA Membership Committee
10213 Buckwood Ave
El Paso, Texas 79925

Phone: 979-595-7711 Email: TMCA membership@gmail.com