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GMCA Newsletter

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We Went Virtual

It became apparent, as we planned for the 2021 GMCA meeting, that it was going to be a better option to have a virtual meeting, given the rising cases of the delta variant of Covid-19 in Georgia. To this end, we enlisted to help of the University of Georgia (UGA) Continuing Education Center.

The virtual meeting was held Wednesday October 20th from 1:30-5:00 pm and Thursday October 21st from 8:30-12:30 pm. The Business Meeting and Officer elections were held immediately after the meeting was over on the 21st.

While the meeting was shorter than normal, we had an agenda filled with interesting and varied talks. Talks, notes, and recordings are available on the GMCA website at http://www.gamosquito.org/Presentations2021.htm.

Since we had not had a meeting the previous year, 2 members needed to be added to the Board. We also needed a new Secretary-Treasurer as Kristin Reichardt, the current ST, is heading south to Florida, where her husband has been posted. The current Board is listed at http://www.gamosquito.org/bod.htm.

As always, we thank our members, commercial members, and sustaining members for their support of the GMCA.

The sustaining members of the GMCA are any persons or firms interested in the promotion of GMCA's purposes. Upon payment of annual dues, these person and organizations are listed at http://www.gamosquito.org/sustmemb.htm.

The commercial members of the GMCA are any commercial pest control company interested in the promotion of GMCA's purposes. Upon payment of annual dues, these pest control companies are listed at http://www.gamosquito.org/commercialmemb.htm.

Active membership is $20 a year, and all persons who are professionally engaged in any branch of mosquito and related pest control work, and persons interested in the cause of mosquito and related pest control who desire affiliation with this association, are eligible for active membership.

Thank you all.

Inside This Issue

We are always looking for contributors to the GMCA Newsletter, so if you have an interesting story to tell about mosquitoes or mosquito control, please send it to rosmarie.kelly@dph.ga.gov.

The University of Georgia Black Fly Research and Resource Center

By Elmer Gray

The University of Georgia (UGA) Black Fly Rearing and Bioassay Laboratory has been awarded a contract with the National Institutes of Health (NIH), National Institute of Allergy and Infectious Diseases (NIAID) to provide partial support for the world's only black fly colony. This support forms a collaborative effort between NIH/NIAID and the University of Georgia Entomology Department to continue the operation of this unique and one-of-a-kind resource. Dr. Darold Batzer of the Entomology Department is the Principal Investigator for this funding effort with Dr. Danny Mead of the Southeastern Cooperative Wildlife Disease Study being a Co-Principal Investigator and Elmer Gray being the Assistant Project Director. Dr. Ray Noblet, the former Entomology Department head, will serve as scientific advisor to the project.

This laboratory has been in operation at UGA since 1999 when Dr. Noblet and the Laboratory Manager, Elmer Gray established the site upon relocating from Clemson University. The black fly colony is a unique resource that was initiated in 1981 at Cornell University (Bernardo et al. 1986). Black flies (Diptera: Simuliidae) require flowing water to complete their life cycle. The colony simulates this environment with 9 aquatic rearing units that create miniature rivers for the larval and pupal stages to develop. Each unit can support approximately 300,000 larvae (Gray and Noblet 2014). Adult flies emerge within the rearing units and are captured, mated and provided moistened substrates to serve as egg laying sites. A particular advantage of *Simulium vittatum* cytospecies IS-7 is that they can deposit their first batch of eggs without a blood meal. Consequently, no animal resources are required to maintain the colony.

The colony has been used for a variety of research projects through the years including a wide range of vector transmission studies, environmental monitoring, vector control and larval feeding studies. The initiation of this branch of the colony took place in 1991 when eggs were received from the original colony which Dr. Ed Cupp had relocated to the University of Arizona. The Clemson branch was initiated to provide late-instar larvae to serve as a standardized test subject for the orbital shaker bioassay that was developed in collaboration with Abbott Laboratories (Barton et al. 1991) at Clemson. Dr. Ray Noblet and Abbott Laboratories had been collaborating on field evaluations of the earliest Vectobac formulations. In an effort to improve the product and develop high potency formulations for the World Health Organization's Onchocerciasis Control Program, an extensive Research and Development effort was ongoing.

The Clemson University laboratory served as Abbott Laboratories primary black fly research site until 1999 when the laboratory moved to the University of Georgia (UGA) where Dr. Noblet was serving as the Department Head of the Entomology Department. The laboratory at UGA has served as a Research and Development site for a variety of Valent BioSciences' black fly research endeavors (Iburg et al. 2010, Iburg et al. 2011, Iburg et al. 2012). Today, the laboratory continues to conduct and collaborate in a wide range of research projects and can provide all stages of the black fly life cycle to collaborating laboratories. Current research being conducted in the laboratory involves larvicidal efficacy evaluations, topical repellent evaluations and growth studies related to climate change. The laboratory has also served as a preferred site for teaching and educational outreach visits for a wide range of students.

This site will now operate as the NIH/NIAID supported **Black Fly Research and Resource Center**. Those interested in receiving material

from the black fly colony should work through the BEI Resources website (www.beiresources). The black fly material is listed under the Vector Resources toggle. All stages of the black fly life cycle are available, live or preserved, as well as total nucleic acid extracts. These materials provide a very unique opportunity for research on this important vector group and the unique biological comparisons that can be conducted with an organism that has been maintained isolated in colonization for forty years. It should be noted that the colony is pathogen free and was genetically characterized about 20 years ago so there is baseline information available. Material from the colony could be used to efficiently conduct vector biology, insect pathology, genetic, predator-prey interactions and a host of other research endeavors.

The UGA Black Fly Research and Resource Center will work in parallel with the NIH supported Filariasis Research Reagent Resource Center (FR^3) that is operated through the University of Georgia College of Veterinary Medicine under the direction of Dr. Andy Moorhead. The mission of FR3 is to provide filarial-related biological products to researchers across North America. The Center for Tropical and Emerging Global Diseases also has a new program, "The SporoCore" which can provide mosquitoes infected with routine or custom strains of rodent malarias to research groups across the US. These centers demonstrate the University of Georgia's commitment to be a world leader in vector biology and disease transmission research.

Contact: Elmer Gray at ewgray@uga.edu for information related to black flies, Dr. Andy Moorhead at amoorhed@uga.edu for information related to filarial materials and Dr. Ash Pathak at ash1@uga.edu for information related to the mosquito/malarial material.

Literature Cited

Barton, W. E., R. Noblet, and D. C. Kurtak. 1991. A simple technique for determining relative toxicities of Bacillus thuringiensis var. israelensis formulations against larval black flies (Diptera: Simuliidae). J. Am. Mosq. Control Assoc. 7:313-315.

Bernardo, M. J., E. W. Cupp and A. E. Kiszewski. 1986. Rearing Black Flies (Diptera: Simuliidae) in the Laboratory: Colonization and Life Table Statistics for *Simulium vittatum*. Annals of the Entomological Society of America. 79: 610-621.

Gray, E. W. and R. Noblet. 2014. Black Fly Rearing and Use in Laboratory Bioassays. In Maramorosch K. and Mahmood F. eds. Rearing Animal and Plant Pathogen Vectors. CRC Press, Boca Raton, FL.

Iburg, J., E. W. Gray, R. D. Wyatt and R. Noblet. 2010. The Influence of Selected Antibiotics on the Response of Black Fly (*Simulium vittatum* Zetterstedt) Larvae to Insecticidal Proteins Produced by *Bacillus thuringiensis* subsp. *israelensis*. Journal of the Society of Environmental Toxicology and Chemistry. 29:1849-1853.

Iburg, J., E. W. Gray, R. D. Wyatt, J. E. Cox, R. A. Fusco and R. Noblet. 2011. The Effect of Seston on Mortality of *Simulium vittatum* (Diptera: Simuliidae) From Insecticidal Proteins Produced by *Bacillus thuringiensis* subsp. *Israelensis.* Journal of Environmental Entomology. 40:1417-1426.

Iburg, J., E. W. Gray, R. D. Wyatt, and R. Noblet. 2012, A spectrophotometric technique for measuring particle ingestion by black fly larvae. Entomologia Experimentalis et Applicata. 146:293-301.

Tick Surveillance on a Budget

Ticks of public health significance are frequent human biters capable of acquiring human pathogens during blood feeding on zoonotic hosts, maintaining infection between life stages, and transmitting pathogens during blood feeding. Of more than 80 species of ticks described in the US, roughly a dozen are frequent human biters and proven vectors of human.

The Georgia Department of Public Health has not had sufficient funding to do active tick surveillance in many years. After ZIKV became a potential issue in Georgia, and funding was provided for increased vector surveillance, a team of 5 Vector Surveillance Coordinators (VSCs) were hired to provide surveillance in all of Georgia's 159 counties. A second entomologist was also hired. With this increase in our ability to do surveillance we were able to collect mosquitoes in every county in Georgia for 3 of the 5 years the program was active. We had transitioned from ZIKV funding to Hurricane Crisis CoAg funding and had hoped to continue the program with ELC funding, when the COVID pandemic began, and funding was cut. Part of what we had hoped to do was to add active tick surveillance to our repertoire, but it was not meant to be.

We had started a collaboration with the Georgia Department of Agriculture to share passive tick surveillance data. Georgia veterinarians were asked to submit ticks collected from animals seen in their practice. The VSCs were tasked with providing collection kits to local veterinarians, picking the kits back up when full, and shipping them to the Veterinary Diagnostics Lab in Iowa. We also started a collaboration with the Georgia Department of Natural Resources to collect ticks off deer at WMA draw hunts, and this year will be collecting ticks off bear as well.

Passive surveillance systems accept reports and tick submissions from the public, animal and human healthcare providers. This method is cost-effective and wide ranging, a sensitive indicator for emerging species, and engages the public and partners.

Specifically, at the spatial scale of US counties, the CDC aims to:

1. classify county status of specific ticks as established, reported, or no data available
2. classify county status for presence of specific human pathogens in specific ticks: present or no data available
3. generate estimates for local prevalence of specific targeted pathogens in relevant life stages of the ticks listed above and local density of host-seeking (infected) nymphs or adults, which then can be aggregated and displayed at county scale; and
4. document host-seeking phenology of all life stages in strategic locations across the tick's range and display this information at state or regional spatial scales.

Owing to the home range of deer, ticks collected off deer provide spatially non-specific data and may not correlate well with estimates of host-seeking tick densities obtained from drag sampling.

Tick collection from deer is acceptable to use to address the following key surveillance objectives:

- Classifying county status for each tick species
- Identifying presence but not prevalence of pathogens in ticks (all active life stages) as blood from the host is likely present

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