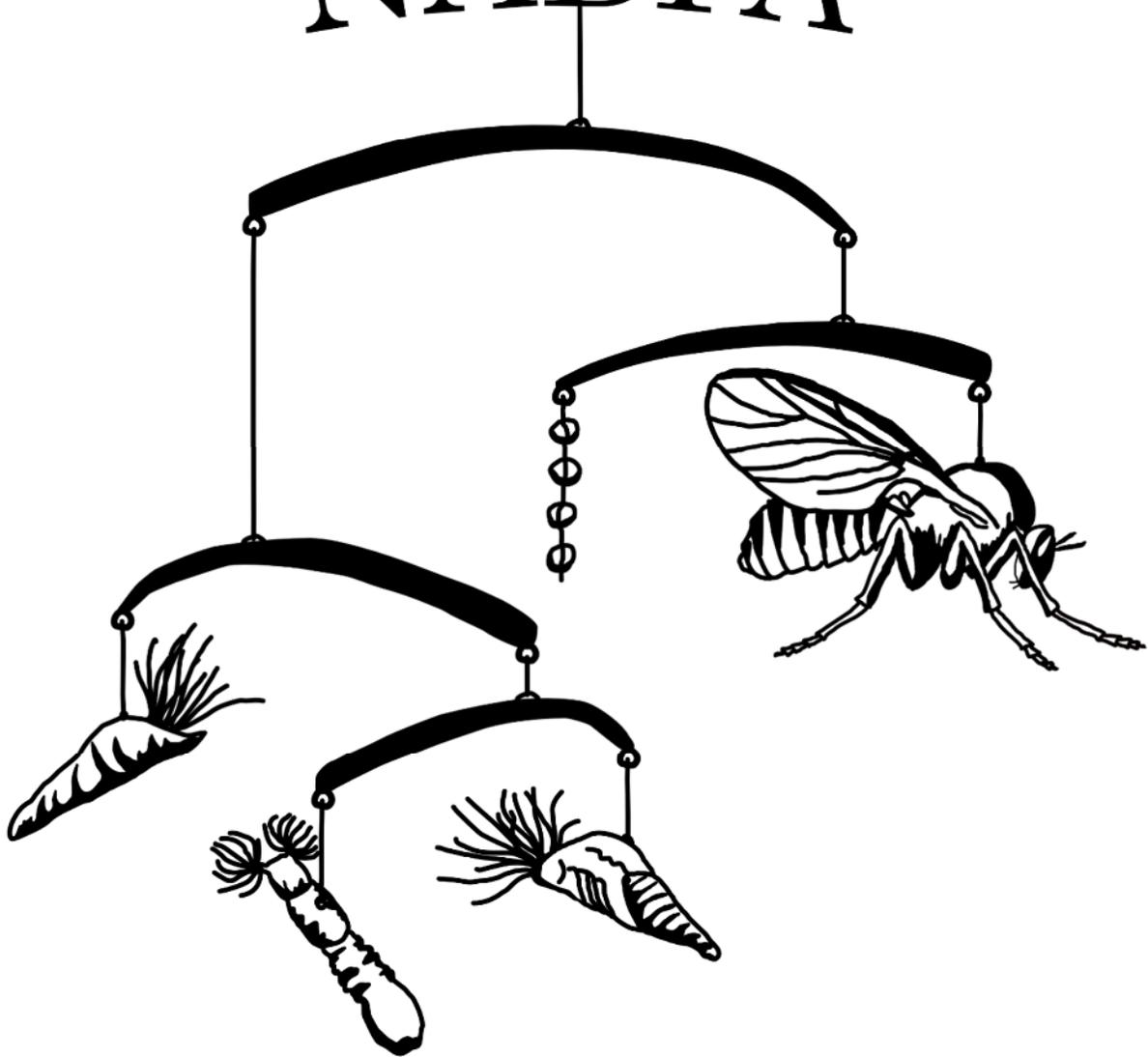


NABFA



Mobile, AL

NORTH AMERICAN BLACK FLY ASSOCIATION

18TH ANNUAL MEETING

February 27-28, 2020

THURSDAY, FEBRUARY 27TH

- 8:30 AM – 8:45 AM Introductions and Welcome to Mobile
John Walz
- 8:45 AM – 9:00 AM In Honor of Doug Craig
Peter Adler
- 9:00 AM – 9:30 AM MMCD Black Fly Control Program update
John Walz, Metropolitan Mosquito Control District (MMCD), St. Paul, MN
- 9:30 AM – 10:00 AM Cryptic diversity in *Simulium (Trichodagmia) rubrithorax* Lutz (Diptera: Simuliidae): how much do we know about its diversity?
Jeane Marcelle C. Nascimento & Neusa Hamada, National Institute for Amazonian Research (INPA), Brazil
- 10:00 AM – 10:30 AM **BREAK**
- 10:30 AM – 11:00 AM Investigations of the Mycetophilidae (Diptera) of North Central Nevada
Robin Gray, Seven Valleys LLC, Winnemucca, NV
- 11:00 AM – 11:30 AM Pennsylvania Black Fly Suppression Program update
Doug Orr, PA Department of Environmental Protection, Harrisburg, PA
- 11:30 AM – 12:00 PM The History of Fire Ants in the U.S.: A Stinging Synopsis
Kelly Palmer, Regional Extension Agent, Brewton, AL
- 12:00 PM – 1:00 PM **LUNCH (PROVIDED) AND GROUP PICTURE**
- 1:00 PM – 1:30 PM An Overview of the Mobile County Vector Services Program
Paul Efird, Director of Vector Services, Mobile County Health Department, Mobile, AL
- 1:30 PM – 2:00 PM Evaluation of Larval Medium in the Controlled Current Toxicity Test
Skyler Magnus Kerr, University of South Alabama, Mobile, AL
- 2:00 PM – 2:30 PM What is All the Buzz Around Black Fly Control in SE Pennsylvania
Paul Mages, PA Department of Environmental Protection, Norristown, PA
- 2:30 PM – 3:00 PM Dirofilariasis as a model for Onchocerciasis in *Simulium vittatum*
Sophie Racey, University of Georgia, Athens, GA
- 3:00 PM – 3:30 PM **BREAK**

THURSDAY, FEBRUARY 27TH (CONTINUED)

- 3:30 PM – 4:00 PM A review of the things that live inside black flies
Charles E. (Eddie) Beard, Clemson University, Clemson, SC
- 4:00 PM – 4:20 PM The architecture of larval black fly-parasite interactions
John W McCreadie, University of South Alabama and PH Adler,
Clemson University
- 4:20 PM – 4:30 PM Collecting ticks from deer heads, yes really
John W McCreadie, RR Wood, JO Rayner, and SM Kerr,
University of South Alabama
- 6:00 PM **DINNER (PROVIDED)**

FRIDAY, FEBRUARY 28TH

- 8:30 AM – 9:00 AM Presence and Prevalence of Ticks and Tick-Borne Infectious
Diseases in Alabama
Skyler Magnus Kerr, University of South Alabama, Mobile, AL
- 9:00 AM – 9:30 AM Drone use at the Metropolitan Mosquito Control District
Scott Grant, Metropolitan Mosquito Control District (MMCD),
St. Paul, MN
- 9:30 AM – 10:00 AM Twenty-Five Years of Black Fly Control in South Carolina
Elmer W. Gray, Department of Entomology, University of Georgia,
Athens, GA
- 10:00 AM – 10:30 AM **BREAK**
- 10:30 AM – 11:00 AM **BUSINESS MEETING - 2021 MEETING PLANS**

Meeting dedicated to black fly researcher and longtime NABFA participant, Dr. Douglas Craig

We thank ADAPCO and Valent BioSciences for sponsoring portions of this meeting.

PRESIDENT: JOHN WALZ
VICE-PRESIDENT: ELMER GRAY
PROGRAM EDITOR: CAREY LAMERE
T-SHIRT DESIGN: KATHY BEADLE

www.nabfa-blackfly.org

Abstracts

A review of the things that live inside black flies

Charles E. (Eddie) Beard, Clemson University

Black flies and mosquitoes host a variety of organisms in their bodies. This will be a travel log of Eukaryotes we have found in black flies, and cameos of mosquitoes and other aquatic Diptera, over the past three decades. Anticipated points of interest include; trichomycetes of course, water mold relatives, other protists, fungi, and some UFOs (Unidentified Found Objects). So remember to look beyond the black flies as you travel along the suppression road. Also, a reminder that when you BTI a stream or pool you are killing non-targets.

Investigations of the Mycetophilidae (Diptera) of North Central Nevada

Robin Gray, Seven Valleys LLC

This study to date has found 13 genera of Mycetophilids living in North Central Nevada. What has been discovered about the biology of five of these genera are discussed. The apparent and curious lack of Mycetophilids in mushrooms in North Central Nevada and the implications of this are considered.

Evaluation of Larval Medium in the Controlled Current Toxicity Test

Skyler Magnus Kerr, University of South Alabama

The Controlled Current Toxicity Test (CCTT) is a protocol used by the University of Georgia Black Fly Rearing and Bioassay Laboratory to evaluate the efficacy of larvicides based on *Bacillus thuringiensis* subsp. *israelensis* (*Bti*) against *Simulium vittatum* larvae. A standard CCTT provides a larval medium with suspended organic nutrients, a sustained current, and a clean surface for black fly larval attachment in each exposure vessel. To streamline the CCTT and eliminate a potential source of variability, 3 types of larval medium were evaluated: deionized water, distilled water, and moderately hard water, which were compared to the currently used protocol. A statistical significance in mean lethal concentration (LC50) rates was observed between the CCTT (deionized water with suspended organic nutrients) medium and the other 3 experimental media. The presence of suspended organic nutrients in the CCTT significantly improved the efficacy of the *Bti*-based larvicide. The interaction of the suspended organic nutrient particles and the *Bti*-based particles in the larvicide appears to produce a mixture that is more efficiently captured and ingested by the black fly larvae than the larvicide formulation particles alone.

Presence and Prevalence of Ticks and Tick-Borne Infectious Diseases in Alabama

Skyler Magnus Kerr, University of South Alabama

Rates of infectious tick-borne disease has increased within the South Eastern United States in the past decade. This project entails a statewide surveillance program to understand and map tick fauna as well as tick-borne disease distributions throughout Alabama. Information gathered will assist Alabama Public Health in creating proper precautions to avoid further increase of infection.

Cryptic diversity in *Simulium (Trichodagmia) rubrithorax* Lutz (Diptera: Simuliidae): how much do we know about its diversity?

Jeane Marcelle C. Nascimento & Neusa Hamada

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National Institute for Amazonian Research (INPA), Brazil

One of the most fundamental units of biology is the species, and an accurate species diagnosis is central to biological research. However, delimiting species based on morphological criteria is often complicated by phenotypic plasticity, genetic variability, cryptic taxa, and the peculiarities of different life stages or genders. Simuliidae includes the largest complex of structurally uniform species of any group of hematophagous arthropods. Due to their morphological homogeneity, blackflies have proven to be taxonomically difficult and much of the diversity within this group may be underestimated. *Simulium rubrithorax* Lutz is restricted to Brazil, where it is present in all major geographical regions. Nominal species with wide distributions and with variability in their biology and behavior can be suspected of being composed of sibling species. This study analyzed genetic diversity and diversification processes in different populations of *S. rubrithorax* in order to investigate the existence of cryptic diversity in this taxon and to attempt to understand the evolutionary processes that have shaped its current distribution. We assessed nucleotide variation within the cytochrome c oxidase subunit I (COI) mitochondrial DNA (mtDNA) gene for 17 populations of *S. rubrithorax* from nine states in Brazil spanning the Amazon, Atlantic Forest, Caatinga and Cerrado biomes. We performed a series of phylogenetic and phylogeographic analysis to assess its genetic structure and to infer its ancestral areas. Using Bayesian inference we conclude that *S. rubrithorax* is composed of at least three distinct clades: Lineage 1, containing two populations from Roraima state, Lineage 2 containing three populations from Ceará and Pernambuco states, and Lineage 3 being the major clade, with all remaining populations analyzed. Taking into account the high values of genetic distance between Lineage 1 and the other analyzed populations (Lineages 2 and 3), a taxonomic investigation was carried out separately for Lineage 1. One hypothesis is that this Lineage corresponds to *Simulium mutucuna*, a species currently in synonymy with *S. rubrithorax*. With respect to Lineages 2 and 3, the population genetics and phylogeographic analyses indicated distinct evolutionary processes involving these two groups. For Lineage 2, despite its more restricted distribution, we hypothesize that, in reality, it consists of two independent evolutionary units. Estimates of divergence time suggest that the diversification of Lineage 2 was probably a result of climate change in the Pleistocene. The phylogeographic reconstruction suggests that the Atlantic forest was the center of origin of the *S. rubrithorax* complex, with a subsequent dispersal to northeast Brazil, where the Lineage 2 originated. Surprisingly, Lineage 3 showed no evidence of cryptic diversity despite its wide geographical distribution.