PROGRAM

NORTH AMERICAN BLACK FLY ASSOCIATION

12TH ANNUAL MEETING

FEBRUARY 22 – 23, 2014

UNIVERSITY OF GEORGIA • CENTER FOR CONTINUING EDUCATION

ATHENS • GEORGIA

SATURDAY, FEBRUARY 22ND

9:00 AM – 9:15 AM	WELCOME TO THE GEORGIA CENTER: INTRODUCTIONS, MEMBER UPDATES, AND NABFA WEBSITE **John Walz**, Metropolitan Mosquito Control District, St. Paul, MN
9:15 AM – 9:45 AM	"GIDDAY MATE! GONDWANAN SIMULIIDS OF AUSTRALIA" **Doug Craig**[1], Doug Currie, and Kevin Moulton [1]Department of Biological Sciences, University of Alberta, Edmonton, Alberta, CANADA
9:45 AM – 10:00 AM	UPDATES FROM THE PENNSYLVANIA AND WEST VIRGINIA PROGRAMS **Elmer W. Gray**
10:00 AM – 10:30 AM	HONEY BEES, VARROA MITES AND COLONY COLLAPSE - AN OVERVIEW **Brett Nolan**, Department of Entomology, University of Georgia, Athens, GA
10:30 AM – 11:00 AM	**BREAK**
11:00 AM – 11:30 AM	INCIPIENT SPECIATION AND ADDITIONAL DIVERSITY WITHIN THE *SIMULIUM ARCTICUM* COMPLEX OF BLACK FLIES (DIPTERA: SIMULIIDAE) **Gerald F. Shields**, Department of Natural Sciences, Carroll College, Helena, MT
11:30 AM – 12:00 PM	EVIDENCE FOR CLIMATE-RELATED CHANGES IN ARCTIC BLACK FLY COMMUNITIES **Douglas C. Currie, PhD** [1] and Patrick Schaefer [1]Curator of Entomology, Department of Natural History, Royal Ontario Museum, Toronto, ON, CANADA
12:00 PM – 12:30 PM	MOLECULAR SYSTEMATIC INVESTIGATIONS WITHIN SIMULIIDAE USING THE NEW POWERFUL NUCLEAR GENE ECP1: THE *SIMULIUM JENNINGSI* GROUP, PLUS TIDBITS ON RELATIONSHIPS WITHIN *SIMULIUM* S.L. AND SIMULIINI **John K. Moulton**, University of Tennessee, Knoxville, TN
12:30 PM – 1:30 PM	**LUNCH (PROVIDED AT GEORGIA CENTER)**
1:30 PM – 3:00 PM	**VISIT** UNIVERSITY OF GEORGIA MUSEUM OF NATURAL HISTORY (1/2 mile walk from Georgia Center)
3:00 PM – 3:30 PM	**BREAK**

SATURDAY, FEBRUARY 22ND (CONTINUED)

3:30 PM – 4:00 PM

ECONOMIC LOSSES ASSOCIATED WITH BLACK FLIES IN TURKEY
Elmer W. Gray[1], Peter H. Adler[2], Savas Sariozkan[3], Abdullah Inci[4], Alparslan Yildirim and Onder Duzlu
[1]University of Georgia, Athens, GA, [2]Clemson University, Clemson, SC, [3]Erciyes University, Department of Animal Health Economics and Management, Kayseri, TURKEY, [4]Erciyes University, Department of Parasitology, Kayseri, TURKEY

4:00 PM – 4:30 PM

BLACK FLIES, ENDANGERED SPECIES, AND THE DILEMMA OF PEST MANAGEMENT
Peter H. Adler[1] and Elmer W. Gray[2]
[1]Clemson University, Clemson, SC, [2] University of Georgia, Athens, GA

4:30 PM – 5:00 PM

TWIN FALLS COUNTY PEST ABATEMENT DISTRICT UPDATE
Kirk Tubbs, Twin Falls County Pest Abatement District, Twin Falls, ID

6:00 PM

BBQ DINNER AND **TOUR** OF RIVERBEND RESEARCH LABS - HOME OF THE BLACK FLY COLONY
(Transportation will be provided)

SUNDAY, FEBRUARY 23RD

9:00 AM – 9:30 AM

IDENTIFICATION OF HOST-SEEKING AND OVIPOSITION COMPOUNDS FOR BLACK FLIES (DIPTERA: SIMULIIDAE)
Tommy W. McGaha Jr.[1], Ryan M. Young, Nathan D. Burkett-Cadena, Moussa Sanfo, Monsuru A. Adeleke, Sayed Hassan, Eddie W. Cupp, Bill J. Baker, Thomas R. Unnasch, and Raymond Noblet
[1]University of South Florida, Tampa, FL

9:30 AM –10:00 AM

THE INFLUENCE OF SELECTED MATERIALS ON *SIMULIUM VITTATUM* FEEDING BEHAVIOR
Joseph P. Iburg, Elmer W. Gray, Ray Noblet, and Roger D. Wyatt
University of Georgia, Athens, GA

10:00 AM – 10:30 AM

BREAK

10:30 AM – 11:00 AM

THE FLOODPLAIN CONTINUUM: A TEMPLATE OF UNDERSTANDING HOW FLOODPLAIN ECOLOGY CHANGES FROM THE MOUNTAINS TO THE SEA
Darold Batzer, Department of Entomology, University of Georgia, Athens, GA

11:00 AM – 11:30 AM

LIVE FROM WINNEMUCCA, NEVADA
Robin Gray, Winnemucca, NV

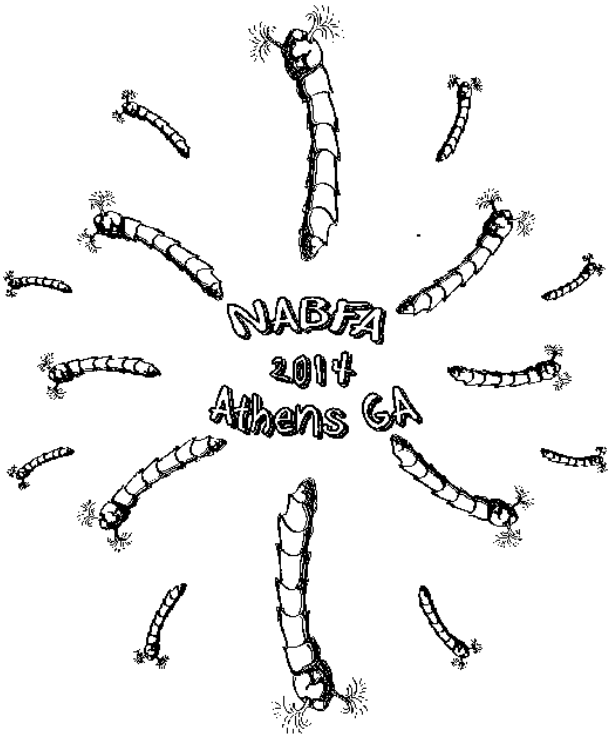
SUNDAY, FEBRUARY 23RD (CONTINUED)

11:30 AM – 12:00 PM	METROPOLITAN MOSQUITO CONTROL DISTRICT (MMCD) BLACK FLY CONTROL PROGRAM UPDATE **John Walz** and Carey LaMere, Metropolitan Mosquito Control District, St. Paul, MN
12:00 PM – 12:30 PM	**BUSINESS MEETING**
	LUNCH (ON YOUR OWN)

Thanks to the Georgia Center for hosting our NABFA meeting!

PRESIDENT: JOHN WALZ
VICE-PRESIDENT: ELMER GRAY
PROGRAM EDITOR: CAREY LAMERE
T-SHIRT DESIGN: MARTY KIRKMAN

www.nabfa-blackfly.org



12TH ANNUAL NABFA MEETING

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PRESENTATIONS TITLES WITH ABSTRACTS

(Alphabetical order by last name of presenter)

BLACK FLIES, ENDANGERED SPECIES, AND THE DILEMMA OF PEST MANAGEMENT

Peter H. Adler[1] & Elmer W. Gray[2]
[1] Clemson University, Clemson, SC 29634; padler@clemson.edu
[2] University of Georgia, Athens, GA 30602

In the past 10 years, several cases have been reported of black flies attacking endangered species and affecting host fitness to various degrees. Pest management of black flies as an aspect of the conservation of endangered species is new and carries a number of novel biological, technical, and ethical challenges. To illustrate these challenges, we present a case study of black flies and the endangered whooping crane (*Grus americana*) in North America.

THE FLOODPLAIN CONTINUUM: A TEMPLATE FOR UNDERSTANDING HOW FLOODPLAIN ECOLOGY CHANGES FROM THE MOUNTAINS TO THE SEA

Darold Batzer, Department of Entomology, University of Georgia, Athens, GA

This study builds upon two prominent models addressing ecological controls on riverine ecosystems, the River Continuum Concept and the Flood Pulse Concept, and focuses on longitudinal change in floodplain invertebrate, fish and plant communities across entire watersheds, from the mountains to the sea. Based on 12 years of study of Southeastern US floodplains, I hypothesize that a hydrologic factor, varying flood pulse character (amplitude, duration, phenology), and a spatial factor, relative importance of ecotonal edge effects, largely control floodplain communities at specific landscape positions.

"GIDDAY MATE! GONDWANAN SIMULIIDS OF AUSTRALIA"

Doug Craig[1], Doug Currie, and Kevin Moulton
[1]Department of Biological Sciences, University of Alberta, Edmonton, Alberta, CANADA

The three authors are planning a collaborative effort to revise the so-called '*Paracnephia*' of Australia. This will involve both molecular and morphological examination and will require collecting new material from Australia. Preliminary work indicates that there may be up to six, or more, genera in this intermediate grade of simuliids. Morphological work is well underway and some of this will be illustrated. That aspect of the effort is, so far, in good agreement with earlier molecular studies. A major problem with the collaborative effort is how to divide up collecting in Australia over the Austral spring later this year, at the times various species occur. Advance notice is given for the annual Australian Entomological Society Meeting in Canberra, September 28 – October 2, 2014.

EVIDENCE FOR CLIMATE-RELATED CHANGES IN ARCTIC BLACK FLY COMMUNITIES

Douglas C. Currie, PhD [1] and Patrick Schaefer
[1]Curator of Entomology, Department of Natural History, Royal Ontario Museum, Toronto, ON, CANADA

No abstract submitted

ECONOMIC LOSSES ASSOCIATED WITH BLACK FLIES IN TURKEY

Elmer W. Gray[1], Peter H. Adler[2], Savas Sariozkan[3], Abdullah Inci[4], Alparslan Yildirim and Onder Duzlu
[1]University of Georgia, Athens, GA, [2]Clemson University, Clemson, SC, [3]Erciyes University, Department of Animal Health Economics and Management, Kayseri, TURKEY, [4]Erciyes University, Department of Parasitology, Kayseri, TURKEY

Turkey's Cappadocia region lies in Eastern Anatolia (Asia Minor) and consists of a plateau more than 1,000 m in altitude pierced by volcanic peaks including Erciyes Mountain (3,916 m). The principal river of the Cappadocia region is the 1,150 km long Kizilirmark River which originates in Eastern Anatolia and eventually empties into the Black Sea. Following construction of the hydroelectric Yamula Dam in Kayseri, completed in 2005, a severe outbreak of black flies occurred along the Kizilirmark River below the dam. The economic costs associated with the 2006-2007 outbreak of *Simulium* (*Wilhelmia*) spp. in this region were calculated by summing losses to the livestock (dairy) industry and tourism (hotels), plus ongoing control expenditures. More than 2,000,000 domestic and foreign tourists, 60,000 animals, and the local population were disturbed by the flies. The calculated cost of the outbreak was 10,638,468 Turkish lira (ca US$8.94 million).

THE INFLUENCE OF SELECTED MATERIALS ON *SIMULIUM VITTATUM* FEEDING BEHAVIOR

Joseph P. Iburg, Elmer W. Gray, Ray Noblet, and Roger D. Wyatt, University of Georgia, Athens, GA

Simulium vittatum larvae were exposed to various materials in a simulated stream environment. The materials included kaolinite clay, cellulose, and diatom frustules. Viable cells of green algae and diatoms were also utilized. Each of these materials was evaluated individually. Larvae were exposed to water insoluble dye particles for 20 minutes after acclimation to a current in media containing the additive. Multiple larvae were recorded for 1 minute intervals during this exposure time using a mounted camera. After completion of the experiment, the average quantity of dye particles consumed by larvae per minute was calculated using a spectrophotometric assay. The video was viewed in slow motion and the average number of times the larvae flicked their cephalic fans per minute was calculated. The results indicated that certain media additives can alter larval flick and ingestion rates. These alterations in feeding behavior correlate with alterations in larval susceptibility to *Bti* when exposed to the same additives.

IDENTIFICATION OF HOST-SEEKING AND OVIPOSITION COMPOUNDS FOR BLACK FLIES (DIPTERA: SIMULIIDAE)

Tommy W. McGaha Jr.[1], Ryan M. Young, Nathan D. Burkett-Cadena, Moussa Sanfo, Monsuru A. Adeleke, Sayed Hassan,' Eddie W. Cupp, Bill J. Baker, Thomas R. Unnasch, and Raymond Noblet
[1]University of South Florida, Tampa, FL

Onchocerciasis, also known as river blindness, is a neglected tropical disease caused by a nematode parasite, *Onchocerca volvulus*, and transmitted by black fly species from the genus *Simulium*. Currently, human landing collections are used to capture black flies for monitoring purposes. To eliminate humans from being used as bait, a trap baited with a lure consisting of attractive compounds has been proposed. *Simulium vittatum*, a North American black fly species, was used as a model species to develop the necessary behavioral bioassays to investigate vectors in Latin America and Africa. These studies have investigated and identified attractive compounds from preferred hosts and conspecific eggs. With the addition of a lure baited trap, monitoring the presence of *O. volvulus* will be more efficient and safer.

MOLECULAR SYSTEMATIC INVESTIGATIONS WITHIN SIMULIIDAE USING THE NEW POWERFUL NUCLEAR GENE ECP1: THE *SIMULIUM JENNINGSI* GROUP, PLUS TIDBITS ON RELATIONSHIPS WITHIN *SIMULIUM* S.L. AND SIMULIINI

John K. Moulton, University of Tennessee, Knoxville, TN

Working molecular phylogenies (gene trees) are presented for the *Simulium jenningsi* species group, Simuliini sensu Currie, and *Simulium* Latreille. Elongation complex protein 1 (ECP1) plays a role in chromatin remodeling and acetylation of histones H3 and H4. It has not previously been used in phylogenetic studies. ECP1 sequences permitted identification of all SJG morphospecies, except *S. nyssa* Stone and Snoddy and the seven species of the *S. fibrinflatum* and *S. taxodium* subgroups. *Simulium aranti* Stone and Snoddy and *S. luggeri* Nicholson and Mickel were consistently recovered at the base of the group. SJG species occupying slow, sandy lowland streams likely form the sister to two clades comprising most SJG species inhabiting swift, rocky upland streams. ECP1 is currently the gold standard for identification of members of the *S. jenningsi* group. ECP1 does a commendable job reconstructing relationships within *Simulium*, but most simuliine relationships remain elusive.

INCIPIENT SPECIATION AND ADDITIONAL DIVERSITY WITHIN THE *SIMULIUM ARCTICUM* COMPLEX OF BLACK FLIES (DIPTERA: SIMULIIDAE)

Gerald F. Shields, Department of Natural Sciences, Carroll College, Helena, MT

In 2009 and 2010 we documented an apparent remnant population of *Simulium saxosum* and *S. arcticum* sensu stricto at the Coeur d'Alene River in northern Idaho (Shields and Kratochvil, 2011). The population was described as a remnant since not only did it possess sex chromosomes specific to *S. saxosum* and *S. arcticum* s. s. but it also had sex chromosomes that were combinations of the two. In the present study (2011-2013) 10 of the 37 collections had sex chromosomes identical to those at the Coeur d'Alene River indicating that the area of the apparent remnant population is approximately 3,500 km^2. These observations are important since they document apparent "mating trials" between incipient species as predicted by Rothfels (1989) and emphasize the importance of chromosome change in black fly speciation. Additionally, two new cytotypes, individuals having unique Y-chromosomes, IIL - 79 st/i at the St. Joe River in northern Idaho and IIS – 15 st/i at the Kootenai River in northern Montana were discovered. The latter observations bring the number of unique Y-chromosome types within the *S. arcticum* complex to 32!

TWIN FALLS COUNTY PEST ABATEMENT DISTRICT UPDATE

Kirk Tubbs, Twin Falls County Pest Abatement District, Twin Falls, ID

Update on new treatments being conducted in the west. Update on results of our targeting of overwintering larva. Observations on interpreting BF adult numbers and how the public perceives those same numbers based on our data.

METROPOLITAN MOSQUITO CONTROL DISTRICT (MMCD) BLACK FLY CONTROL PROGRAM UPDATE

John Walz and Carey LaMere, Metropolitan Mosquito Control District, St. Paul, MN

The goal of the Metropolitan Mosquito Control District (MMCD)'s Black Fly Control Program is to reduce pest populations of black flies within the MMCD to tolerable levels. The MMCD monitors 171 small stream sites and 29 large river sites in the 7-county metropolitan area surrounding Minneapolis-St. Paul. An update of the 2013 season will be discussed.
