Southern Lepidopterists' Society

and

ASSOCIATION FOR TROPICAL LEPIDOPTERA

2015 Annual Meeting

McGuire Center for Lepidoptera and Biodiversity

Florida Museum of Natural History, University of Florida,
Gainesville, Florida
16 – 18 October 2015

Front Cover: male *Hemileuca maia* from Walker County, Georgia, 11 November 2014, collected by Andrew D. Warren. Big thanks to James K. Adams for directions to the locality and company in the field!

FALL MEETING OF THE SOUTHERN LEPIDOPTERISTS' SOCIETY AND THE ASSOCIATION FOR TROPICAL LEPIDOPTERA
OCTOBER 16-18, 2015

McGuire Center for Lepidoptera and Biodiversity Conference Room, Florida Museum of Natural History, University of Florida, Gainesville, Florida

Local Arrangements

Meeting Coordinators:
Jacqueline Y. Miller and Deborah L. Matthews.

Organizing Committee: Charles V. Covell, Christine Eliazar, Peter J. Eliazar, Thomas C. Emmel, Deborah L. Matthews, Jacqueline Y. Miller, Tom Neal, and Keith R. Willmott.

Banquet/Lunch:
Tom Neal and Jacqueline Y. Miller.

Field Trip Coordinator:
Charles V. Covell.

Group Photograph and ATL Photo Contest:
Andrei Sourakov

Collection Access:
Andrew D. Warren and Andrei Sourakov.

Program:
Deborah L. Matthews, Jacqueline Y. Miller and Christine Eliazar.

Technical Support:
James B. Schlachta and Ian K. Segebarth.

Evening Program:
Andrei Sourakov, James K. Adams, Andrew D. Warren, and Charles V. Covell.

Registration:
Elena Ortiz and Geena M. Hill.

and

ASSOCIATION FOR TROPICAL LEPIDOPTERA

Schedule of Events

Friday, October 16

2:00 – 5:00 pm: **Registration,** Powell Hall Classroom (watch for signs in lobby), Florida Museum of Natural History, UF Cultural Plaza, University of Florida.

7:00pm – 12:00am: **Night Collecting**, Charles V. Covell will be leading the evening moth trip and has made arrangements with the rangers at Paynes Prairie. Members attending should be prepared to pick up a quick dinner (neither food nor drinks will be provided) and drive out to Paynes Prairie Preserve State Park located 10 miles south of Gainesville, in Micanopy, on the east side of US 441. You may meet Charlie in the North Hilton Hotel parking lot at 6:15pm if you wish to caravan or carpool to the Park or meet at the Park visitor center parking lot at 7:00pm. We plan to be out of the park by midnight. Please contact Charlie if you would like to participate (352-273-2023; ccovell@ flmnh.ufl.edu). Please remember to bring your mosquito repellent along with flashlight/headlamp and other collecting gear. All field trip participants must sign a release form.

Saturday, October 17

Please follow the signs and enter the McGuire Center through the north staircase entrance.

8:00 – 8:45: **Registration** and reception.

MORNING SESSION

Moderator: Peter J. Eliazar

8:50 **Opening remarks**: Thomas C. Emmel, Charles V. Covell

9:00 – 9:20: **Charles V. Covell**
"A wonderful life: 65 years with Lepidoptera"

9:25 – 9:45: **Andrew D. Warren (et al.)**
"New discoveries from right here in Florida: *Erynnis baptisiae* (Hesperiidae: Pyrginae) is widespread in northern peninsular counties"

9:50 – 10:10: **John V. Calhoun (et al.)**
"New discoveries from right here in Florida: *Lethe creola* (Nymphalidae: Satyrinae) is a breeding resident"

10:15 – 10:35: BREAK

10:40 – 11:00: **Deborah L. Matthews (et al.)**
"Guantanamo blues: Taking a closer look at *Cyclargus* (Lepidoptera: Lycaenidae) from Cuba"

11:05 – 11:25: **Jeffrey R. Slotten**
"Life history of *Catocala messalina* Guenée"

11:30 – 11:50: **James K. Adams**
"Digitization of sphingids and saturniids at the McGuire Center"

11:55 – 12:15: **Akito Y. Kawahara (presenter, Barber et al.)**
"Moth tails divert bat attack: Evolution of acoustic deflection"

12:20: **Group Photo**, McGuire Center outside steps.

12:25 – 1:25: **Lunch** at McGuire Center (courtesy of the Neal family Subway).

AFTERNOON SESSION

Moderator: Thomas C. Emmel

1:30 – 1:50: **Andrei Sourakov**
"Phenotypic plasticity in *Utetheisa ornatrix bella* (Erebidae, Arctiinae)"

1:55 – 2:15: **Clara Brandon**
"A case of host-herbivore evolutionary arms race"

2:20 – 2:40: **Marianne Espeland (et al.)**
"A phylogeny of all butterfly species using next-generation sequencing methods"

2:45 – 3:05: **Maria F. Checa and Keith R. Willmott**
"Quantitative analysis of methodological bias associated with different bait types in Neotropical butterfly research"

3:10 - 3:30: BREAK

3:35 - 3:55: **Shinichi Nakahara**
"Taxonomic revision of the genus *Euptychia* Hübner, 1818 (Lepidoptera: Nymphalidae: Satyrinae)"

4:00 – 4:20: **John Pickering**
"How aposematic and cryptic coloration may affect moth flight phenology, population genetic structure, and rates of evolution"

4:25 – 4:55: **Leroy Koehn**
"Bait traps: new designs and how, when, and where to use them. And be a better baiter!"

5:00 – 5:30: **Business Meeting**, Southern Lepidopterists' Society

EVENING EVENTS

6:15 – 8:30: **Banquet**, Central Gallery, Powell Hall, Florida Museum of Natural History.

A Tribute to the Late Irving L. Finkelstein – Andrei Sourakov, Andrew D. Warren and James K. Adams
Door Prizes and Photo Awards – Charles V. Covell and Andrei Sourakov

Sunday, October 18

8:00 – 8:40: **Morning reception**, McGuire Center Conference Room

MORNING SESSION

Moderator: Keith R. Willmott

8:45 – 9:05: **Elena Ortiz et al.**
"Insights into the origin and evolution of preponine butterflies"

9:10 – 9:30: **Denise Tan and Keith R. Willmott**
"Using *COI* sequence data to define Ecuadorian *Hermeuptychia*: the first step in an integrative approach to resolving species limits in this widely distributed and cryptic genus"

9:35 – 9:55: **Jade Aster Badon**
"The evolution and biogeography of the genus *Appias* (Lepidoptera: Pieridae: Pierinae)"

10:00 – 10:20: BREAK

10:25 – 10:45: **Patricio Salazar Carrion**
"Non-coincident colour pattern clines suggest a potential route for establishment of hybrid phenotypes in *Heliconius* butterflies"

10:50 – 11:10: **Peter R. Houlihan**
"Ghost hunting: The pollination ecology of elusive long-spurred orchids in the Caribbean (*Dendrophylax* spp.)"

11:15 – 11:35: **Rick Cech**
"Butterflies in Southern Amazonia: How to Find a Place, a Time and a Habitat"

11:40 –12:00: **Marc C. Minno**
"Disappearing Butterflies on Big Pine Key, Florida"

12:05 – 12:25: **Keith R. Willmott and Jason P.W. Hall**
"Hunting high and low: In search of Ecuador's most mysterious butterflies"

12:30 – 1:00: **Business Meeting**, Association for Tropical Lepidoptera.

Posters

Hayden, James E., E. Richard Hoebeke, Matthew Bertone, and Vernon A. Brou Jr., "'*Diaphania*' *costata* (F.), a misidentified pest of Apocynaceae in the Southeastern United States"

Lewis, Delano S., Felix A. H. Sperling, Shinichi Nakahara, Adam M. Cotton, Akito Y. Kawahara, and Fabien L. Condamine, "Role of Caribbean Islands in the Diversification and Biogeography of Neotropical *Heraclides* Swallowtails"

Abstracts

Adams, James K., Department of Natural Science, Dalton State College, Dalton, GA 30720, (jadams@daltonstate.edu).

"Digitization of sphingids and saturniids at the McGuire Center"

The McGuire Center for Lepidoptera and Biodiversity at the Florida Museum of Natural History in Gainesville, Florida, is

working toward digitizing its collection. This May through July, I worked on a project with Akito Kawahara to image three sphingid genera (*Eumorpha*, *Manduca*, *Xylophanes*) and hemileucine saturniids. For each species, images were taken of upperside and underside of both male and female, and additional specimens were imaged when there is some significant variation. This is part of NSF's goal to digitize natural history collections in the U.S. Not only does it represent photographic documentation of what IS in the collection, but will ultimately be available to researchers via IDIGBIO and other NSF funded initiatives.

Badon, Jade Aster, McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL 32611-2710 (jaabadon@gmail.com).

"The evolution and biogeography of the Genus *Appias* (Lepidoptera: Pieridae: Pierinae)"

The Genus *Appias* comprises more than 40 species which is distributed in Africa, Asia, and Australia. The genus is known to be confusing to other authors due to its variability. The paper will discuss the evolution and biogeography of 26 species occurring in Tropical Africa, Asia, to Australia. Hundreds of specimens were examined in the collection of the McGuire Center for Lepidoptera and Biodiversity to understand the biogeographic pattern of these species. Certain species and subspecies are quite distinct while others are not easily separable due to variations within each population. New subspecies discovered from islands in the Philippines and Tonga archipelagos will also be presented.

Barber, Jesse R.[1], Brian C. Leavell[1], Adam L. Keener[1], Jesse W. Breinholt[2], Brad A. Chadwell[3], Christopher J.W. McClure[1,4], Geena M. Hill[2], and Akito Y. Kawahara[2], [1]Department of Biological Sciences, Boise State University, Boise, ID 83725; [2]Florida Museum of Natural History, McGuire Center for Lepidoptera and Biodiversity, University of Florida, Gainesville, FL 32611; [3]Department of Anatomy and Neurobiology, Northeast Ohio Medical University, Rootstown,

OH 44272; and [4]Peregrine Fund, Boise, ID 83709 (jessebarber@boisestate.edu or kawahara@flmnh.ufl.edu).

"Moth tails divert bat attack: Evolution of acoustic deflection"

Adaptations to divert the attacks of visually guided predators have evolved repeatedly in animals. Using high-speed infrared videography, we show that luna moths (*Actias luna*) generate an acoustic diversion with spinning hindwing tails to deflect echolocating bat attacks away from their body and toward these nonessential appendages. We pit luna moths against big brown bats (*Eptesicus fuscus*) and demonstrate a survival advantage of ~47% for moths with tails versus those that had their tails removed. The benefit of hindwing tails is equivalent to the advantage conferred to moths by bat-detecting ears. Moth tails lured bat attacks to these wing regions during 55% of interactions between bats and intact luna moths. We analyzed flight kinematics of moths with and without hindwing tails and suggest that tails have a minimal role in flight performance. Using a robust phylogeny, we find that long spatulate tails have independently evolved four times in saturniid moths, further supporting the selective advantage of this anti-bat strategy. Diversionary tactics are perhaps more common than appreciated in predator–prey interactions. Our finding suggests that focusing on the sensory ecologies of key predators will reveal such countermeasures in prey.

Brandon, Clara and Andrei Sourakov, McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL 32611-2710 (asourakov@flmnh.ufl.edu).

"A case of host-herbivore evolutionary arms race"

Past studies that explored the presence of evolutionary arms race between toxic *Crotalaria* plants and their herbivores focused mostly on chemical co-evolution. We hypothesized that in this highly specious genus of plants, other defenses, such as mechanical protection of seeds, which are wanted by specialist herbivores for their nutrients and alkaloids, have also been

evolving, together with the herbivores' ability to overcome them. To test this hypothesis, we assessed the cost of penetration imposed on a specialist herbivore – the larvae of the bella moth, *Utetheisa ornatrix* - by the pericarps of three *Crotalaria* species. The cost associated with larval penetration of pericarps was the greatest for species that has been co-evolving with herbivores the longest. These results are consistent with an evolutionary arms race between hosts and herbivores in this system.

Calhoun, John V.[1], Patrick R. Leary[2], Bill Berthet[3], and Andrew D. Warren[4], [1]977 Wicks Drive, Palm Harbor, FL 34684, [2]1291 S. 3rd Street, Fernandina Beach, FL 32034, [3]12885 Julington Rd, Jacksonville, FL 32258, [4]McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL, USA, 32611-2710 (bretcal1@verizon.net).

"New discoveries from right here in Florida: *Lethe creola* (Nymphalidae: Satyrinae) is a breeding resident"

Lethe (*Enodia*) *creola* was attributed to Florida for over a century, yet no valid specimens or photographs were known until 20 April 2015, when a single male was photographed at Ralph E. Simmons Memorial State Forest, Nassau County. A search of archival photographs in the personal collection of one of the authors revealed an even earlier record of *L. creola*, taken at Ralph E. Simmons on 26 August 2012. Our research indicates that the species occurs in several bottomland forest habitats at Ralph E. Simmons, always in association with stands of its hostplant, giant cane, *Arundinaria gigantea*. Between April and September 2015 we observed numerous individuals at three separate sites within the forest. Three potentially overlapping broods are likely produced, with adults flying from mid-April to late September or early October. It is likely that additional populations await discovery in northern Florida.

Checa, Maria F. and Keith R. Willmott, McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL 32611-2710, (mcheca@ufl.edu).

"Quantitative analysis of methodological bias associated with different bait types in Neotropical butterfly research"

Two collection methods are predominantly used for butterflies: baited traps and hand-nets. In terms of baits, a wide variety is used mainly fermented banana, but also feces, urine, and carrion. However, information about bait attractiveness is very scarce, and very few comparative studies are available that quantitatively tested differences in performance of baits, or how the use of different baits affects or biases results. A 3-year sampling was carried out in Western Ecuador in wet, transition and dry forests from Nov 2010 to Sept 2013. Two different baits were utilized, carrion (rotting prawn) and fruits (fermented banana). A total of 7046 individuals and 214 species were collected. Carrion baits consistently attracted more species compared to banana across study sites, although, fruit-baited traps were more likely to attract a higher number of individuals. Furthermore, species attracted exclusively to prawn were nearly twice as many butterfly species exclusively found in banana, and this pattern was consistent across ecosystems. Hence, using solely prawn as bait in all locations resulted in collecting at least 75% of species. Moreover, carrion baits were more efficient attracting males than females in the transition forest, 1056 and 43 respectively, and this difference was highly significant. Similar stratification patterns in terms of butterfly abundance over all study sites were detected regardless of bait type used; but contradictory results were found for species richness and butterfly diversity. Finally, both baits resulted in a similar general pattern of highest numbers of species and individuals during the rainy season, but peaks were more conspicuous for carrion-attracted butterfly communities. These results showed caution is needed when reaching conclusions in Neotropical butterfly research using traps, as bait type use can influence results.

Covell, Charles V., McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL, 32611-2710 (ccovell@flmnh.ufl.edu).

"A wonderful life: 65 years with Lepidoptera"

From October, 1949 to the present, the author has enjoyed many memorable experiences with Lepidoptera and lepidopterists in NC, VA, KY, FL, other states, and on trips to 15 tropical countries. Some details of research, writing and meeting activities over these 65 years are included.

Cech, Rick, 315 West 23rd Street, Suite MA, New York, NY 10011, (rcech@nyc.rr.com).

"Butterflies in Southern Amazonia: How to Find a Place, a Time and a Habitat"

Would-be voyagers to southern Amazonia often cast their imaginations on this vast expanse of neotropical habitat with fantasy-like zeal. As if one could parachute into the region and immediately begin experiencing its exotic attractions. And this despite the fact that the surface area of Brazil (3.3 million mi^2) is slightly larger than that of the lower-48 United States (3.1 million mi^2), with much of it badly degraded. There are wonders to be had in this vast area, even in unlikely spots, but as with all real estate ventures it pays to know something about location. Here is a brief introductory tour.

Espeland, Marianne[1], Jesse Breinholt[1], Naomi Pierce[2], Keith R. Willmott[1], and Akito Y. Kawahara[1], [1]McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL 32611-2710, [2]Department of Organismic and Evolutionary Biology, 26 Oxford Street, Harvard University, Cambridge MA 02138.

"A phylogeny of all butterfly species using next-generation sequencing methods"

Next generation sequencing approaches within Papilionoidea (butterflies and skippers) are mostly limited to very closely related species. Currently, most higher-level phylogenetic studies of Papilionoidea utilize 4 to 10 'standard' loci, and these genes often do not provide robust support for deeper relationships

within the superfamily. We will use a target enrichment approach and Illumina sequencing to sequence 452 loci of length 300-2200bp for 156 taxa covering all butterfly tribes and the Hedylidae. To assess capture success and phylogenetic signal at a lower taxonomic level, we will also sequence 96 members of the subtribe Euptychiina (Satyrinae, Nymphalidae). This probe kit contains the most commonly used mitochondrial and nuclear loci (COI, Ef1-a, wg, GAPDH, Rps5, Rps2, IDH, MDH, CAD, ArgK, DDC), and can readily be combined with available sequence data. Preliminary results show that these 452 loci provide robust support for both higher and lower taxonomic levels, and we will expand our study to include all butterfly species.

Hayden, James E.[1], [1] E. Richard Hoebeke[2], Matthew Bertone[3], and Vernon A. Brou, Jr.[4], [1]FDACS Division of Plant Industry, 1911 SW 34th St. Gainesville, FL, USA (James.Hayden@FreshFromFlorida.com), [2]UGA Collection of Arthropods, Georgia Mus. of Nat. Hist., Athens, GA, USA, [3]NCSU Plant Disease and Insect Clinic, NC State University, Raleigh, NC, USA, [4]70420 Jack Loyd Road, Abita Springs, LA, USA.

POSTER - "'*Diaphania*' *costata* (F.), a misidentified pest of Apocynaceae in the Southeastern United States"

"*Diaphania*" *costata* (F.) (Crambidae: Spilomelinae) is endemic to Central America and the Caribbean, where it is a leaf-folder on Apocynaceae. Although it has been recorded in Texas, USA for decades, in fact it has become widespread across the southeastern US, usually misidentified as *Palpita* spp. We have discovered it defoliating *Vinca major* L. and other ornamental Apocynaceae in Georgia and North Carolina. Collection records indicate that the population has expanded from Texas since at least 1979. Like *Cydalima perspectalis* (Walker), a related pest of *Buxus* (box tree) in Europe, it has been historically placed in many genera. Cladistic analysis indicates that *D. costata* should be transferred to the Palaeotropical genus *Parotis* Hübner. With many exceptions, the trend of host associations in the *Glyphodes-Diaphania* group is feeding on laticiferous plants.

Houlihan, Peter R., Department of Biology, University of Florida, Gainesville, FL 32611 and McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL 32611-2710 (phoulihan@ufl.edu).

"Ghost hunting: The pollination ecology of elusive long-spurred orchids in the Caribbean (*Dendrophylax* spp.)"

For more than 150 years, biologists have been captivated by the ecology and evolution of Darwin's orchids. However, despite their charismatic appearance, little is known regarding the pollination biology of these long-spurred orchids. While pollination syndromes suggest hawkmoth pollination, very few species actually have known pollinators. This critical information gap is of grave concern as many species, confined to islands or fragmented habitats, are listed as endangered. A comprehensive understanding of the pollination ecology of these species is crucial to enact appropriate conservation measures that will ensure the survival of these orchids and their pollinators. I will discuss my ongoing research regarding these orchids, with a particular focus on the ghost orchids of the Caribbean (*Dendrophylax* spp.).

Koehn, Leroy C., 3000 Fairway Court, Georgetown, KY 40324 (leptraps@aol.com).

"Bait traps: New designs and how, when, and where to use them. And be a better baiter!"

The Slotted Pan, Tropics Upward and Kill Type are three new designs. The Slotted Pan is very effective and virtually escape proof. The Tropical Upward uses the upward movement of butterflies towards light as a means of trapping butterflies into a bright area at the top of the trap cylinder. The Kill Type bait trap design allows the user to set out the trap and leave it unattended for several days. Virtually every insect that enters the trap will be killed. It is a great bait trap for collecting winter moths in more temperate climates. I will also discuss techniques for how to

make and use a good bait, how long the bait will remain effective, and how to prevent other critters, ants, and mice, from gaining access to the bait.

Lewis, Delano S.[1], Felix A. H. Sperling[2], Shinichi Nakaharaa[3], Adam M. Cotton[4], Akito Y. Kawahara[3], and Fabien L. Condamine[5], [1]Office of Research and Grants, Northern Caribbean University, Manchester Road, Mandeville, Jamaica, WI; [2]Department of Biological Sciences, University of Alberta, Edmonton, AB, Canada T6G 2E9, [3]McGuire Center for Lepidoptera and Biodiversity/Powell Hall, Florida Museum of Natural History, University of Florida, 3215 Hull Road, PO Box 112710, Gainesville FL, 32611-2710, [4]c86 / 2 Moo 5, Tambon Nong Kwai, Hang Dong, Chiang Mai, Thailand 50230; [5]CNRS, UMR 7641 Centre de Mathématiques Appliquées (Ecole Polytechnique), Palaiseau, France (delano.lewis@ncu.edu.jm).

POSTER - "Role of Caribbean Islands in the diversification and biogeography of Neotropical *Heraclides* Swallowtails"

Numerous hypotheses on the evolution of Neotropical biodiversity have stimulated research to provide a better understanding of diversity dynamics and distribution patterns of the region. However, few studies integrate molecular and morphological data with complete sampling of a Neotropical group, and so there has been little synthesis of the multiple processes governing biodiversity through space and time. Here, a total-evidence phylogenetic approach is used to reconstruct the evolutionary history of the butterfly subgenus *Heraclides*. We used DNA sequences for two mitochondrial genes and one nuclear gene and coded 133 morphological characters of larvae and adults. A robust and well-resolved phylogeny was obtained using several analytical approaches, while molecular dating and biogeographical analyses indicated an early Miocene origin (22 Mya) in the Caribbean Islands. We inferred six independent dispersal events from the Caribbean to the mainland, and three from the mainland to the Caribbean, and we suggest that cooling climates with decreasing sea levels may have contributed to these events. The time-calibrated tree is best explained by a museum model of diversity in which both speciation and

extinction rates remained constant through time. By assessing both continental and fine-scale biodiversity patterns, this study provides new findings, for instance that islands may act as a source of diversity rather than as a sink, to explain spatio-temporal macroevolutionary processes within the Neotropical region.

Matthews, Deborah L.[1], Jacqueline Y. Miller[1], Andrew D. Warren[1], James K. Toomey[2], Roger W. Portell[2], Terry A. Lott[2] and Nick V. Grishin[3], [1]McGuire Center for Lepidoptera and Biodiversity and [2]Dickinson Hall, Florida Museum of Natural History, University of Florida, P. O. Box 117800, Gainesville, FL, USA, 32611-2710, [3]Howard Hughes Medical Institute and Department of Biochemistry, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd., Dallas, TX, 75390-9050 (dlott@ flmnh.ufl.edu).

"Guantanamo blues: Taking a closer look at *Cyclargus* (Lepidoptera: Lycaenidae) from Cuba"

Lists of Cuban butterflies include but a single species of *Cyclargus*: *C. ammon*. To our surprise, recent Lepidoptera surveys of the US Naval Base, Guantanamo Bay turned up 3 specimens of *C. thomasi* along with 11 *C. ammon*, as confirmed by genitalic dissection. Examination of McGuire Center specimens curated as *C. ammon* revealed an additional 18 *C. thomasi* from the Guantanamo province. Morphological study of *Cyclargus* from Florida, the Bahamas, and West Indies confidently outlined variation and diagnostic characters of *C. thomasi* vs. *C. ammon* by wing patterns, male and female genitalia. However, CO1 DNA barcode sequences of Guantanamo *C. thomasi* and *C. ammon* were identical. Moreover, nearly 100 CO1 barcodes of *Cyclargus* across the range revealed less than 1% difference and poor correlation between CO1 haplotypes and species. Being very closely related, these species are likely to hybridize, leading to introgression, possibly complicated by incomplete lineage sorting.

Minno, Marc C., 600 NW 35th Terrace, Gainesville, FL 32607 (marcminno@gmail.com).

"Disappearing Butterflies on Big Pine Key, Florida"

The butterfly fauna of the Florida Keys is a mixture of local resident species and temporary colonizers and strays from the West Indies and the mainland. Big Pine Key in the lower Keys is especially important for conservation because it has a significant amount of pine rockland (> 1,200 acres), a rare habitat. At least 77 different kinds of butterflies have been reported from Big Pine Key since the 1970s. About 30% of the reported species are strays. Some 18 species have not been seen in recent times despite greater searching. Eleven formerly resident butterflies have disappeared from Big Pine Key including the now endangered Florida Leafwing (*Anaea troglodyta floridalis*) and Miami Blue (*Cyclargus thomasi bethunebakeri*) as well as the extinct Zestos Skipper (*Epargyreus zestos oberon*) and Meske's Skipper (*Hesperia meskei pinocayo*). Resident butterflies on Big Pine Key of greatest conservation need are Bartram's Scrub-Hairstreak (*Strymon acis bartrami*), Martial Scrub-Hairstreak (*Strymon martialis*), Florida Duskywing (*Ephyriades brunnea floridensis*), and the Keys form of the Palatka Skipper (*Euphyes pilatka klotsi*). Big Pine Key butterflies are most threatened by hurricanes/tropical storms, habitat changes, land management practices, and exotic predatory ants.

Nakahara, **Shinichi,** McGuire Center for Lepidoptera and Biodiversity/Powell Hall, Florida Museum of Natural History, University of Florida, PO Box 112710, Gainesville FL, 32611-2710 (snakahara@ufl.edu).

"Taxonomic revision of the genus *Euptychia* Hübner, 1818 (Lepidoptera: Nymphalidae: Satyrinae)"

Among the poorly studied nymphalid subtribe Euptychiina, the genus *Euptychia* Hübner, 1818 is the oldest generic name. Although the relationship between *Euptychia* and the remainder of the subtribe remains unclear, recent molecular phylogeny supports its monophyly. *Euptychia* is one of the most species-rich genera in the subtribe, and currently I recognise some 50

species within the genus. Given that 29 *Euptychia* species were recognised back in 2004, including undescribed species, this indicates that our understanding of the genus was far from compete back then. In fact, a notable feature is that there are more undescribed species than described species in *Euptychia*, an extremely unusual situation for a Neotropical butterfly genus. These facts indicate how superficially *Euptychia* has been studied and support the necessity for an in-depth study. Here I present recent taxonomic changes regarding *Euptychia*, and discuss several species in this genus.

Ortiz-Acevedo, Elena, Marianne Espeland and Keith R. Willmott, McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL, USA, 32611.

"Insights into the origin and evolution of preponine butterflies"

The nymphalid butterfly tribe Preponini includes some of the most spectacular butterflies in the Neotropics. The taxonomy of the group remained stable for many years until a recent phylogenetic hypothesis suggested major changes. In this study we complement the aforementioned hypothesis with 38 samples and three nuclear markers for a total of 87 preponine representatives. We used Maximum Likelihood and Bayesian Inference to reconstruct the phylogenetic relationships in order to (i) explore in detail the species level issues and (ii) investigate the evolution of the tribe from a geographical and temporal perspective. Broadening the taxonomic representation, by including specimens from distant geographical locations and different coloration patterns, allowed us to uncover unknown phylogenetic diversity. However, a more detailed study is still needed. Additionally, our preliminary biogeographical analyses suggest that the tribe most likely originated in the North Central Andes or the Amazon basin, with subsequent dispersal to Central America and southern South America.

Pickering, John, Discover Life and the University of Georgia
http://www.discoverlife.org/who/Pickering,_John.html.

“How aposematic and cryptic coloration may affect moth flight phenology, population genetic structure, and rates of evolution”

Discover Life's Mothing project's scientific objectives are to understand how weather patterns, urbanization, latitude, and other factors affect moth communities. Since 2010, participants have photographed over 500,000 insects at 22 study sites in the eastern United States and Costa Rica, documenting nightly differences in the seasonal activity and abundance of 3,000+ moth species across years and sites. My talk will focus on how coloration affects flight patterns in aposematic and cryptic species, showing how the former have more synchronized flights with sharper peaks. I will discuss how this newly discovered phenomenon may affect the genetic structure of populations along a latitudinal gradient, leading to possible "temporal vicariance" between northern and southern populations of aposematic species that have more than one flight per year. For details see http://www.discoverlife.org/moth.

Salazar Carrion, Patricio, McGuire Center for Lepidoptera and Biodiversity/Powell Hall, Florida Museum of Natural History, University of Florida, PO Box 112710, Gainesville FL, 32611-2710 (psalazarc@flmnh.ufl.edu).

“Non-coincident colour pattern clines suggest a potential route for establishment of hybrid phenotypes in *Heliconius* butterflies”

Hybridization was traditionally thought to constrain population divergence, and therefore speciation and diversification. In recent years, however, the idea that hybridization can actually promote diversification is increasingly supported, because hybridization – by producing new genetic combinations - constitutes a source of genetic variability, upon which natural and/or sexual selection can act. As a result, it is possible that divergent lineages of hybrid origin originate when a hybrid combination of alleles become fixed in a population. The exact mechanisms through which divergent hybrid populations become established are, however, far from understood. This is a study about two overlapping zones of hybridisation between divergent colour-pattern races of two *Heliconius* butterfly species, whose

unique structure – with non-coincident clines and an unexpectedly high frequency of one particular hybrid phenotype – suggests a possible route for the establishment of hybrid lineages.

Slotten, Jeffrey R., 5421 NW 69th Lane, Gainesville, FL 32653 (slotten@bellsouth.net).

"Life History of *Catocala messalina* Guenée"

Catocala messalina has been recorded from a number of states in the southern half of the United States from the Atlantic Coast in the east through Texas and Kansas in the west. However, it is one of the few species of North American *Catocala* whose life history has not yet been published. Barnes and McDunnough (1918) gave the following account: "*Messalina*, the only species in the group XIV (*Andrewsia* Grote), has usually been placed close to *Catocala amica* on account of the lack of a median dark band on the secondaries; a study of the male claspers, however, shows that its affiliates are rather with the *Catocala illecta* group than with *amica*; the early stages will probably shed light on the correct position." Dave Hawks had previously successfully reared several *C. messalina* larvae on *Quercus* in captivity in California, from a female taken in Hays County, Texas in 1986 (Larry Gall, pers. comm.), but I am unaware of other rearings of this species. Here I present some notes and photographs of the immature stages of this underwing.

Sourakov, Andrei, McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL 32611-2710
(asourakov@flmnh.ufl.edu).

"Phenotypic Plasticity In *Utetheisa ornatrix bella* (Erebidae, Arctiinae)"

Crotalaria plants and the bella moth, *Utetheisa ornatrix*, are closely linked to each other: the larvae destroy the seeds, while the moth depends on the hostplants for alkaloids. To better understand ongoing co-evolution, native hostplants were

compared as food to exotic ones, with native plants leading to faster larval development. Seed-feeding on all hosts led to accelerated larval development and a resultant larger adult moth, and correlated with higher nitrogen content in the host. Differences in morphology and phenology of *Crotalaria* determine the ecology of *U. ornatrix* populations. This moth species also exhibits variability in wing pattern, and evidence is presented that there exists temperature-dependent phenotypic plasticity in this character for *U. o. bella*. Experimental groups of late instar larvae and pupae were reared at lower temperatures, while control groups of sibling larvae were raised through at higher temperatures. Resultant moths had different wing pattern phenotypes. Increased melanization is the probable cause of the observed differences, as the cold-affected individuals had more extensive black markings.

Tan, Denise, and Keith R. Willmott, McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL, USA, 32611-2710 (denisetsh@ufl.edu).

"Using *COI* sequence data to define Ecuadorian *Hermeuptychia*: The first step in an integrative approach to resolving species limits in this widely distributed and cryptic genus"

The genus *Hermeuptychia* (Nymphalidae, Satyrinae, Euptychiina) currently consists of ten recognised species with an extensive distribution from southern USA to northern Argentina. Despite most species being relatively common, the taxonomy of the group has been particularly challenging because these butterflies show high intraspecific variability in wing patterns and otherwise possess very similar external morphologies. In addition, relevant type specimens are often old, missing or damaged, making it difficult to re-examine diagnostic characters. Recent studies using DNA sequence data have shown that the true species diversity of *Hermeuptychia* is seriously underestimated, even in the USA. The situation in Neotropical countries, such as Ecuador, one of the world's three most diverse countries, is obviously even more complex. Exploring the degree of divergence in mitochondrial *COI* sequences allows us to

broadly survey diversity and identify distinct 'genetic species-groups' for further investigation of morphological differences and studies of reproductive compatibility. Ultimately, integrating findings from diverse data types should improve estimates of species limits, while shedding light on factors driving speciation within *Hermeuptychia*. Here we present a preliminary phylogeny for Ecuadorian *Hermeuptychia* based on 180 specimens from numerous localities. Species delimitation is performed using two coalescent-based methods, generalized mixed Yule coalescent (GMYC) and Poison tree process (PTP). Our dataset suggests the existence of at least six *Hermeuptychia* species in Ecuador, and we discuss evidence for two distinctive, undescribed *Hermeuptychia* species.

Warren, Andrew D.[1], John V. Calhoun[2], and Bill Berthet[3]
[1]McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL, USA, 32611-2710, [2]977 Wicks Drive, Palm Harbor, FL 34684, [3]12885 Julington Rd, Jacksonville, FL 32258 (hesperioidea@yahoo.com).

"New discoveries from right here in Florida: *Erynnis baptisiae* (Hesperiidae: Pyrginae) is widespread in northern peninsular counties"

Erynnis baptisiae has long been known from scattered sites in the Florida panhandle, but its presence in peninsular counties has not previously been verified. On 23 May 2015 a large population of *E. baptisiae* was discovered at Jennings State Forest, Clay County, in close association with dense stands of *Baptisia lecontei*. Subsequent observations included numerous ovipositions on *B. lecontei*, confirming it as a new larval foodplant for *E. baptisiae*. Herbarium records for *B. lecontei* were obtained, and sites in Nassau, Dixie, Lafayette, Columbia, Suwannee, Gilchrist, Alachua, Levy and Citrus counties were searched, over the following two weeks, for *B. lecontei* and *E. baptisiae*. Large populations of the plant and butterfly were located in Columbia, Suwannee and Gilchrist counties, representing the southernmost confirmed records for *E. baptisiae* in Florida. These records demonstrate that the skipper is

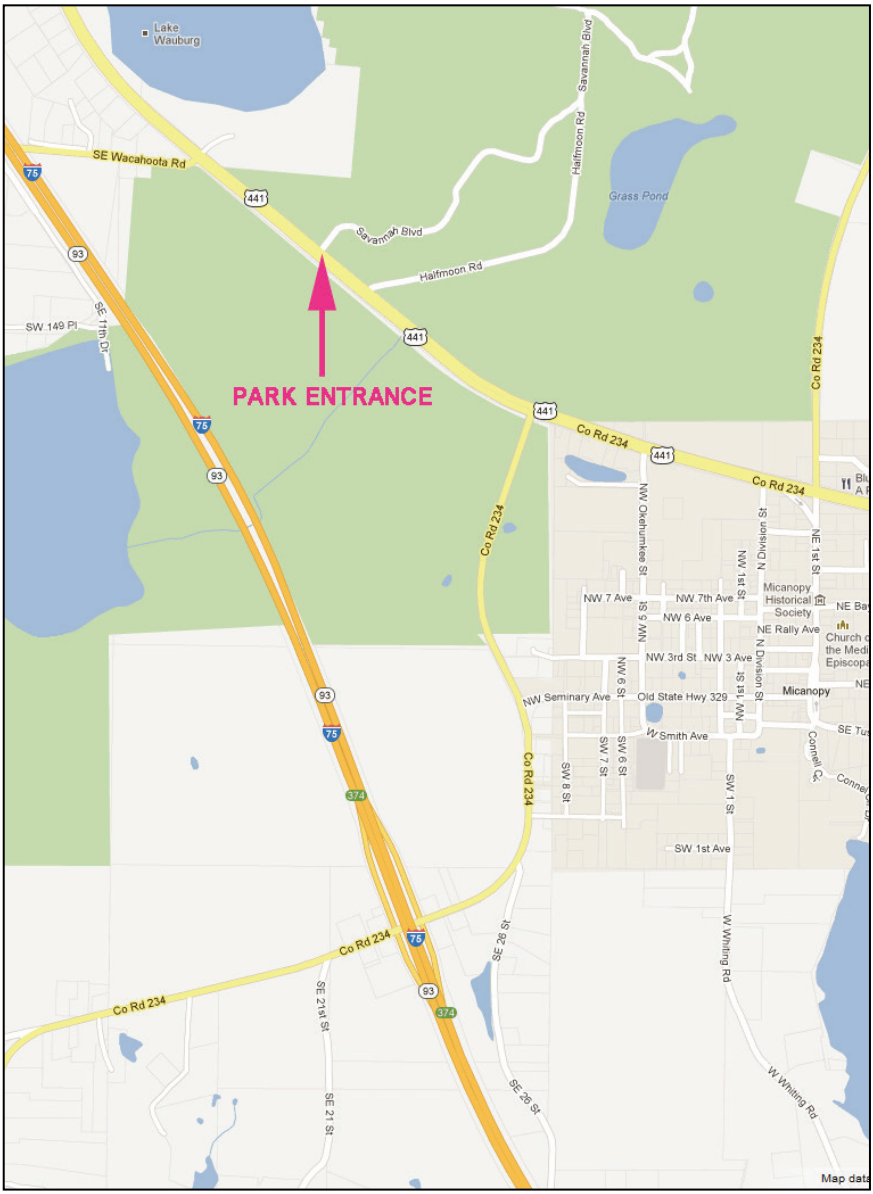
widespread in northern peninsular counties, where it is locally abundant in fire-maintained pine flatwood and sandhill habitats, flying throughout the spring and summer in four potentially overlapping broods. We suggest that additional populations of *E. baptisiae* are likely to be found in peninsular counties where *B. lecontei* grows in abundance.

Willmott, Keith R.[1] and Jason P. W. Hall[2], [1]McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL, USA, 32611-2710, [2]Department of Entomology, National Museum of Natural History, Smithsonian Institution, Washington DC, USA (kwillmott@flmnh.ufl.edu).

"Hunting high and low: In search of Ecuador's most mysterious butterflies"

Ecuador is one of the world's three most diverse countries for butterflies, with about 20-25% of the world's species. We have been studying Ecuador's butterfly fauna for more than 20 years, documenting its diversity, distribution and natural history, and attempting to resolve the species taxonomy. Many species remain known from single localities or specimens, and we are constantly exploring new regions and methods to better record such species. In this talk we describe our recent field work in Ecuador and promising new methods and strategies. Priority areas of the country include the far northwestern lowland rainforests, the far eastern lowlands, and the southeastern foothills and adjacent lowlands, with these areas having both high species diversity and lying at the limits of biogeographic regions. We describe a number of ongoing or potential projects and techniques for sampling both canopy and poorly known understorey butterflies, including long-term bait-trapping studies, recipes for banana baits, single-rope-techniques, the canopy bicycle, malaise traps and bamboo grove inventories.

Payne's Prairie State Park

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Baby Changing Station
Water Fountain
Security Office
Front Desk Ticketing
Gift Shop
First Aid
Stairs
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CAMELLIA COURT CAFÉ
BICYCLE RACKS
VISIBLE COLLECTIONS & LABS
SOUTH FLORIDA PEOPLE & ENVIRONMENTS
FLORIDA FOSSILS: EVOLUTION OF LIFE & LAND
BUTTERFLY RAINFOREST GIFT SHOP
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BUTTERFLY EXHIBITS
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DESIGN & FABRICATION
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ADMINISTRATION
(closed to the public)
CHILDREN'S GALLERY
COVERED OUTDOOR PICNIC AREA
CLASSROOM
COLLECTORS SHOP
BICYCLE RACKS
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