Southern Lepidopterists' NEWS

EST. 1978 Official Newsletter of the Southern Lepidopterists' Society (ISSN 2167-0285)

Vol. 38 NO. 4 **December 31, 2016**

THE OFFICIAL PUBLICATION OF THE SOUTHERN LEPIDOPTERISTS' SOCIETY ORGANIZED TO PROMOTE SCIENTIFIC INTEREST AND KNOWLEDGE RELATED TO UNDERSTANDING THE LEPIDOPTERA FAUNA OF THE SOUTHERN REGION OF THE UNITED STATES (WEBSITE: www.southernlepsoc.org/)

J. BARRY LOMBARDINI: EDITOR

With "butterfly weather" quickly receding into our collective rear view mirrors, Parker Backstrom offers an enticing respite from thoughts of the long, cold winter months ahead. Travel with him across North Carolina, from the Appalachians to the Outer Banks, sampling the mosaics of color and form that are the butterflies of the Old North State. He showcases species well known to us, and introduces us to some that might not be as familiar, all viewed through his camera lens and those of some of the state's most skilled butterfly photographers. **Join Parker beginning on page 294.**

Pearl Crescent (*Phycoides tharos*) [2012-Apr-06 – Chatham Co NC, Bear Creek]. It's familiarity is part of the allure of the Pearl Crescent. This individual was found resting quietly upon the flower of a dwarf pawpaw (*Asimina parviflora*) in the photographer's back yard, chilled by the cold, early morning air.

***American Copper (Lycaena phlaeas)* [2005-Jul-16 – Allegheny Co NC]. American Coppers always manage to brighten the meadows through which they flit. This one was found basking upon sun-warmed, lichen-covered rocks in picturesque Doughton Park, located along the Blue Ridge Parkway.**

White M Hairstreak (Parrhassius m-album) [2005-Mar-25 – Moore Co NC, Weymouth Woods]. On a stark, early spring day in the sandhills, this hairstreak blended in well against a landscape of brown and gray, only tiny, momentary flashes of sparkling blue playing against the drabness of its surroundings.

SPRING FIELD TRIP TO THE FLORIDA PANHANDLE
April 28 - May 1, 2017
BY
JOHN F. DOUGLASS

A warm invitation is extended to members and friends to participate in a field meeting centered at Marianna in Florida's Central Panhandle (Fig. 1) during the weekend of April 28-May 1, 2017 (Mother's Day is May 14). The region is known for the extraordinary beauty of its natural features (Fig. 2). The Chipola River, for example, is fed by 60+ freshwater springs, more than any other river in Northwest Florida.

Three days and nights of photography and collecting are planned. Permits for the taking of voucher specimens are being arranged, and participants are encouraged to bring MV and blacklighting gear (new moon is April 26). SLS members and botanists from the FNPS will explore, all day and into each night, the flora and lepidopteran fauna of this unique area.

Additional meeting details, including maps and a list of local motels, will be provided in the March NEWS. Please join us for what promises to be a fun and rewarding trip! Coordinator: John Douglass [jfdouglass7@gmail.com; (419) 389-9902].

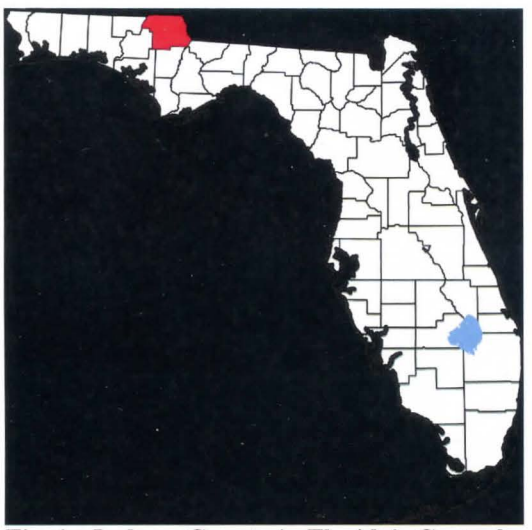

Fig. 1. Jackson County in Florida's Central Panhandle.

Fig. 2. Jackson Blue Springs near Marianna, Florida. Photo by Paul Clark.

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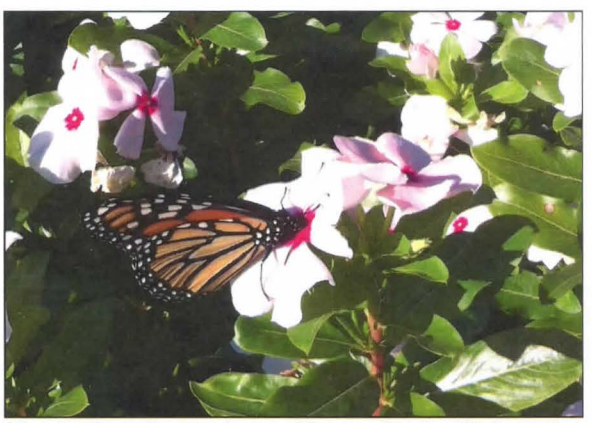

Horticultural Gardens, Texas Tech University, (Lubbock) (September 2016)

Abilene, Texas (November 2016)

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ARGILLOPHORA FURCILLA GROTE, 1873 (LEPIDOPTERA: NOCTUIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

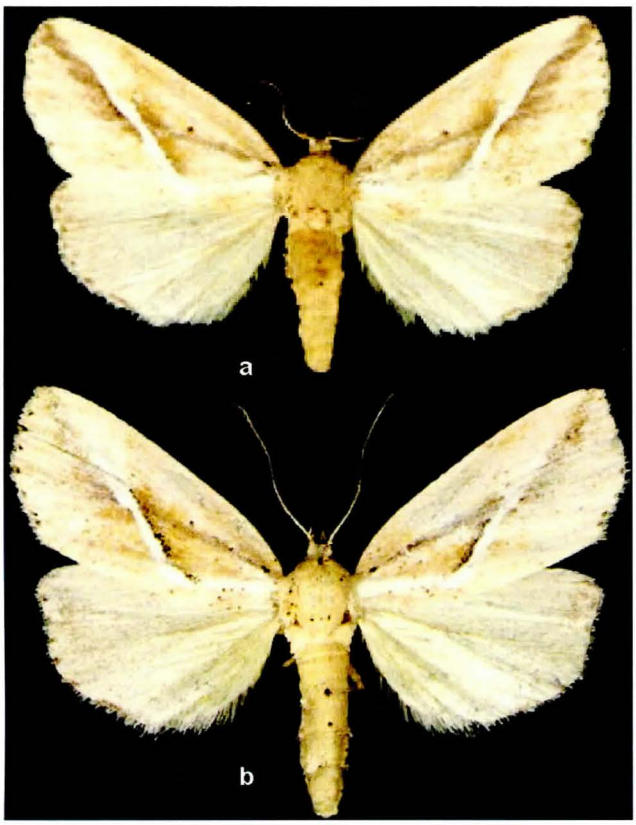

Fig. 1. ***Argillophora furcilla*:** a. male, b. female.

The localized and not often encountered species ***Argillophora furcilla*** Grote (Fig.1), has been recorded in Louisiana by the capture of about two dozen adult specimens. The small number of adults captured from late April into July seems to indicate a single annual brood peaking in June (Fig. 2).

Grote described this species from central Alabama in The Lepidoptera of North America (1873), also see (Bull US Nat. Mus., 1893). Poole (1989) included 2 species in the genus ***Argillphora***. Syntypes, both male & female from Central Alabama, are located in the Museum of Natural History, London. Hampson (1910) on page 482, describe the physical characteristics of the genus as well as the Type, a female from Alabama.

This species was illustrated by a drawing in Holland's The Moth Book (1903) on page 255.

This species was not covered by Covell (1984), nor Powell and Opler (2009). Heppner (2003) listed the range of ***furcilla*** to include the states of Tennessee to Florida, and Arkansas to Texas, in the months April and July. The larvae of ***furcilla*** reportedly feeds upon bamboo canes (*Arundinaria* sp.)

The parish records are illustrated in Fig. 3.

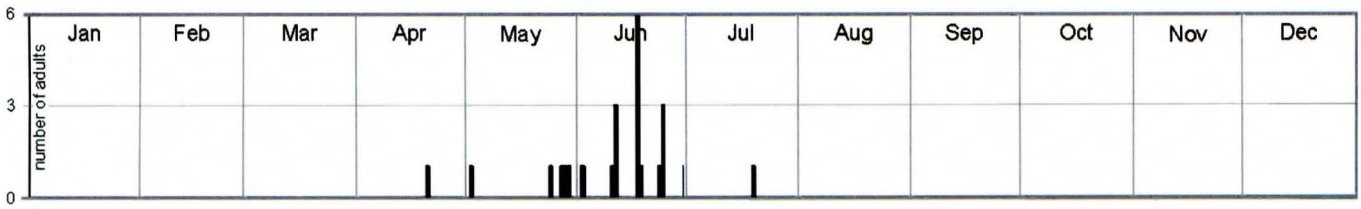

Fig. 2. Adult ***Argillophora furcilla*** captured in Louisiana. n = 25

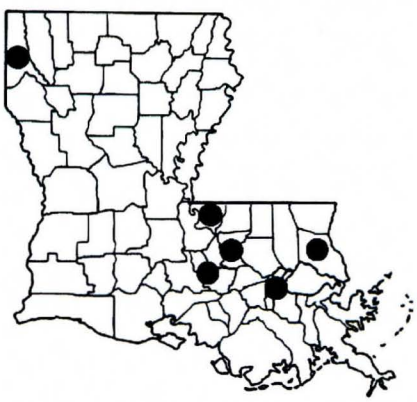

Fig. 3. Parish records for ***A. furcilla***.

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Powell, J.A. and **P.A. Opler,** 2009 *Moths of Western North America*, Univ.Calif. Press xiii + 369 pp + 64 plates.

THE MESSENGER

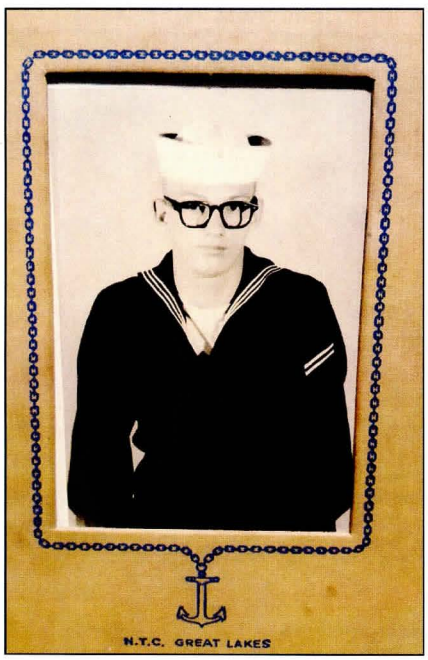
BY

CANDY SARIKONDA

Butterflies have had spiritual meaning for many people throughout history and in the present day. People of various cultures and traditions view the butterfly as a symbol of transformation, resurrection, freedom and the evolution of the soul. As messengers of the moment, butterflies remind us to be still, to quiet our minds, and to take in all that is around us. They reassure us in times of challenge, and console us in our grief.

My father passed away recently. A strong and kind man, he taught me many valuable life lessons – the value of a good day's hard work; to give my best at whatever I put my mind to; and to live by the Golden Rule. I have fond memories of our fishing trips on the Great Lakes together, the beautiful sunrises we often witnessed on the lakes, and the peaceful moments we spent relaxing on a porch swing at the water's edge.

I wasn't ready for my father to leave. I wanted one last fishing trip, one last sunrise…but alas, it was not to be. My father's body was failing him, and I knew the time had come. We held hands, and I kissed him goodbye.



Over the coming days, I hoped he would give me some sign that he was ok. I have spent many years studying other cultures, learning about different ideas concerning the soul and our journeys in life and death. I felt strongly he would send me a message, but what would it be? When would it be? I needed that reassurance, I needed to be certain my dad was still with me.

Our family met with the funeral director. We gathered in his office, pouring over papers my mother had brought with her. My father had served in the Navy for six years as a radar operator in Japan, and was discharged as a second class Radar Electronics Technician. He had often spoken proudly of his service, but I had never seen a photo of him from those years. From the pile of papers, my mother pulled out a photo of him in uniform. At 24 years old, he was young and determined, staring back at me from the photo with his usual strength of character. His Navy blue and white uniform, the Navy design etched on the mat surrounding his photo – the aged blue, white and black of the photo stood out to me. I lovingly held the photo, staring at it and noting its every detail.

A few days later, I visited my local store in search of a memorial plaque. A store clerk who knew me, saw me and asked how I was doing. She knew my father's health was poor, and I fought tears as I looked at her to respond. But I couldn't speak, and she gave me a knowing nod. I rushed out of the store, and retreated to my car. The tears poured down my face, as I tried to compose myself and start the engine. The moment I started the car, the song "Monument" by Mutemath was playing on the radio. The first words I heard were, "There's a memory around the corner, There's an angel on our shoulders, To remind us life is far from over…" My jaw dropped, I gasped and anxiously looked in all directions. I knew he was there. I took a deep breath, closed my eyes and said, "Thank you, Dad."

I spent the coming days working to keep myself together, focusing on caring for my young family and meeting my duties as wife and mother. I wanted my kids to know it was ok to grieve, but I also knew it was hard for them to see my sadness. I tried to soften their grief, and protect them from mine. My youngest son Jayden was afraid to go asleep, afraid he would not wake up. We had many discussions about the difference between death and sleep, and he wanted reassurance that Papa was ok. One morning, I

drove him to school. As I pulled into a parking space, I noticed a small butterfly resting at the tip of a tall blade of grass directly in front of our car. I stepped out of the car, and my son and I approached the butterfly. As we came closer, I noticed the striking blue, white and black coloration. I knew immediately who it was. I turned to my son, and said, "This butterfly is bringing you a message from Grandpa. He wants you to know he is ok." The Common Checkered Skipper made no attempt to fly away, but instead continued to rest on the blade of grass, even opening its wings to bask. It stayed with us, visiting for several minutes. The skipper allowed me to hold the blade of grass it was resting upon, giving me further reassurance that this normally shy species was a messenger meant for us. I then walked Jayden to the school door, and upon my return I noticed it was gone.

Gone, but not forgotten.

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I Am Always With You

When I am gone, release me, let me go.
I have so many things to see and do,
You mustn't tie yourself to me with too many tears,
But be thankful we had so many good years.

I gave you my love, and you can only guess
How much you've given me in happiness.
I thank you for the love that you have shown,
But now it is time I traveled on alone.

So grieve for me a while, if grieve you must
Then let your grief be comforted by trust
That it is only for a while that we must part,
So treasure the memories within your heart.

I won't be far away for life goes on.
And if you need me, call and I will come.
Though you can't see or touch me, I will be near
And if you listen with your heart, you'll hear
All my love around you soft and clear

And then, when you come this way alone,
I'll greet you with a smile and a "Welcome Home."

Unknown

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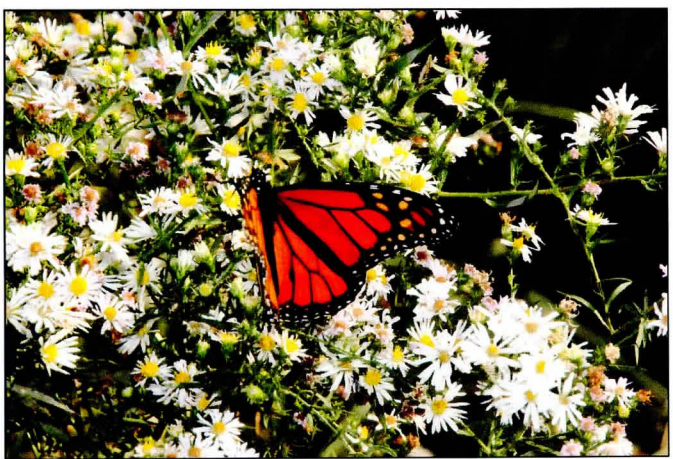

Danaus plexippus **nectaring on aster (*Symphyotrichum pilosum*)(Cove Creek Rd. Washington County, Arkansas)(October, 2016)(Photo by David Rupe)**

Strymon melinus **nectaring on aster (*Symphyotrichum pilosum*)(Cove Creek Rd. Washington County, Arkansas)(October, 2016)(Photo by David Rupe)**

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METAPONPNEUMATA ROGENHOFERI MÖSCHLER, 1890 (LEPIDOPTERA: NOCTUIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

Fig. 1. ***Metaponpneumata rogenhoferi*** phenotype variations: a-r, males and females.

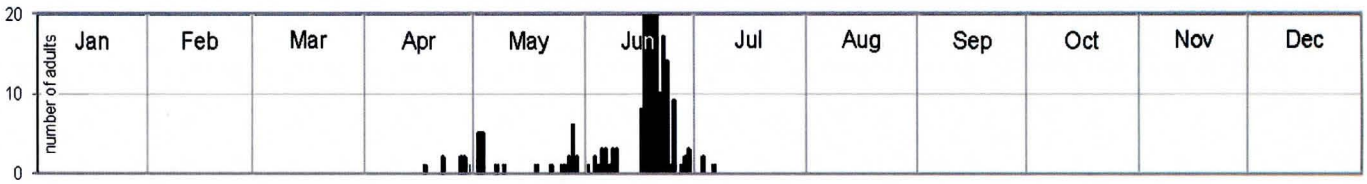

Fig. 2. Adult ***Metaponpneumata rogenhoferi*** captured in Louisiana. n = 223

Fig. 3. Parish records for ***M. rogenhoferi***.

The occasionally encountered and small migrant moth ***Metaponpneumata rogenhoferi*** Möschler (1890) (Fig. 1) has been captured within Louisiana by this author for over 45 years. This documented agricultural pest species was previously reported upon by Cordero, et al. (1999), based upon 145 adults; 117 in the (USNM) U.S. National Museum, and 28 specimens from the (MEM) Mississippi Entomological Museum, along with additional records gleaned from a select and limited number of public and private collections. These same authors reported only a single specimen previously from Louisiana captured June 20, from New Orleans, Orleans Parish, based upon those same sources of adult specimens, and that the distribution of ***rogenhoferi*** includes central Texas to southern California, south to Central America, Colombia, and Venezuela. I have accumulated a small series of 223 adults from Louisiana, indicating what appears to possibly represent two

flights (broods) occurring from mid April into early July (Fig. 2), peaking early May and mid July. For more extensive insight concerning the previous literature of this species, readers are directed to Cordero, et al. (1999), who listed 20 references, some of which provide detailed information concerning ***rogenhoferi***. This species was not covered by Covell (1984), nor Heppner (2003), nor Holland (1903). Powell and Opler (2009) stated ***rogenhoferi*** occurs from southern California into Baja California, east to southern Arizona and western Texas in May-June, and August-September. These same authors mistakenly stated the life history was unreported, though it was addressed 10 years earlier by Cordero, et al. (1999). The parish records are illustrated in Fig. 3.

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Horticultural Gardens on Texas Tech University (Lubbock, Texas) (September 29, 2016)

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A LIFE FOR LEPIDOPTERA: CHARLES W. BORDELON JR.

DECEMBER 15, 1958 - SEPTEMBER 25, 2016

After a 9 month battle with cancer, Charles passed away peacefully at his home in Beaumont, TX. He was survived by his wife Susan Lee, and his sisters Jayne and Patrice, and his brother Patrick. His parents pre-deceased him.

Charles W. Bordelon Jr.

Charles was one of the most intelligent people that I have ever had the privilege to know. He also was also very friendly and kind, but determined and courageous in the trials of life. He cherished his home and garden in Beaumont, and of course his partner, Susan, for some 30 years. They were formally married in 2009. He was born in Lafayette, LA, and moved frequently, including Harlingen, TX, Houston, TX, Longview, TX, before settling in Beaumont. He received a BS from Lamar University in Beaumont. Where ever he was he was always interested in insects especially Lepidoptera, beginning to collect them at age 4.

In 1991, when I was doing duty as Zone Coordinator for Texas, for the Lepidopterists Society, I received a report from Charles, which was so well organized and accurate, that I had to meet him. I turned over this job to Charles in 1995, which continued until the onset of his illness in 2016. We began a long association and friendship, that led to many travels including most of the state of Texas, Arizona, New Mexico, California, Colorado, Wyoming, Florida and Georgia. We even spent an amazing 2 weeks in Yasuni Nat'l Park in Ecuador. Our main goal was to further the knowledge of Texas Lepidoptera. We completed surveys of Lepidoptera in Big Thicket National Preserve (a project initiated by Charles in 1994), Big Bend National Park, Guadalupe Mountains National Park, The Davis Mountains, The Texas Hill Country, and the Texas Panhandle Region. For each of these places, we produced self published illustrated checklists which were quite popular. There was another survey and checklist for the sesiid moths of Texas, and a three volume checklist for the lower Rio Grande Valley. Thirty+ separate papers were published on Texas Lepidoptera and appeared mainly in the News of the Lepidopterists Society, and the Southern Lepidopterists News. Contributions were also made by us to the new Annotated Checklist of the Noctuoidea of North America by J.D. Lafontaine and B. C. Schmidt, which was published by ZooKeys, and many other researchers in Lepidoptera.

Charles excelled at field work and was very good at this. He was a champion for collecting, even when many people disagreed with this position, but many came around to his point of view. In all our work in places where we had permits for collecting, very few specimens were actually collected. The emphasis was always on finding new records and undescribed species. We combined our collections in 2005 and this was called the Texas Lepidoptera Survey Research collection. It will be donated, hopefully by the end of 2017, to the Florida State Collection of Arthropods at the McGuire Center in Gainesville, FL, which now undergoing a major expansion.

Charles was a member of the Lepidopterists' Society and the Southern Lepidopterists Society going back to the early 1980's for the former and 1996 for the latter, and we attended meetings and other events when we could. We also participated in the South Texas Butterfly Festival for several years. Through these and other events, Charles got to meet many fellow Lepidopterists and made many friends. Charles was honored by have a subspecies of the skipper *Poanes aaroni bordeloni*, which he discovered, named for him. There will be other patronyms, perhaps many, to come.

I hope that many of our fellow Lepidopterists, will take the time to remember Charles and reflect on his legacy. I encourage you to share your thoughts in the pages of this publication, or others. Contributions, in his name, can be made to the Humane Society or the ASPCA, or a fund to support Lepidoptera work in this Society. I will miss my best friend, and I extend my greatest sympathy to Susan and Charles' other friends and family.

[Submitted by Ed Knudson, 8517 Burkhart Rd., Houston, TX, 77055]

HORAMA PANTHALON TEXANA (GROTE, 1868) (LEPIDOPTERA: EREBIDAE IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

Fig. 1. ***Horama panthalon texana*** phenotypes: a. male, b. female.

The wasp-like **euchrom**id moth, ***Horama panthalon texana*** (Grote) is a scarcely encountered species within Louisiana, at least in ultraviolet light traps. This species can be both diurnal and nocturnal regarding time of adult activity.

Dietz and Duckworth (1976) remarked of ***texana***, "This race is closely related to the typical ***panthalon*** from the Caribbean. Its geographic distribution is distinct,...".

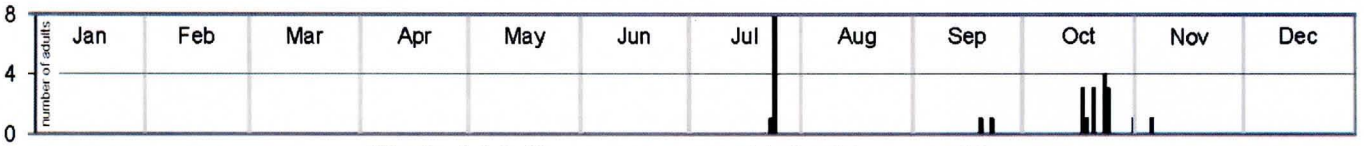

Fig. 2. Adult ***H. p. texana*** captured in Louisiana. n = 30

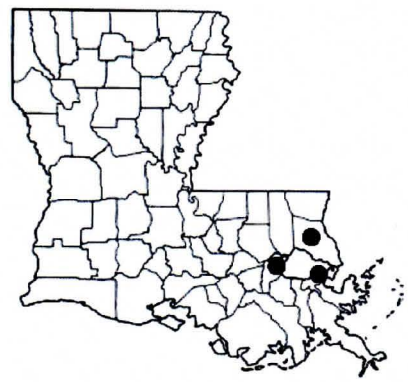

Fig. 3. Parish records for ***H. p. texana***.

Dietz and Duckworth (1976) appear to have accomplished a remarkable investigation and revision of numerous species among the genera ***Horama*** Hübner (11 species and subspecies), and ***Poliopastea*** Hampson (25 species). It is unclear as to whether Covell (1984) was aware of Dietz and Duckworth's 1976 earlier generic revision of the genus, as he listed this species simply ***Horama panthalon*** (Fabricius), but he did further note that the North American subspecies is ***H. p. texana*** (Grote). Covell provided only a short selected lists of references in his publication, absent of Dietz and Duckworth (1976). Though, that earlier 1976 publication was responsible for providing "NEW STATUS" for ***H. p. texana.*** No specimens of ***p. texana*** from Louisiana were found in the collection of the Louisiana State Arthropod Museum per Christopher Carlton.

Covell (1984) listed the range of ***texana*** as "S. Texas, rare in Florida, all months". Heppner (2003) listed ***texana*** from Florida, Texas, and Mexico, (as a stray in Fla - November). If those Florida strays were in the southern terminal portions of the state, one would surmise that they might probably be the nominate ***Horama panthalon panthalon*** (Fabricius) from the Caribbean. Dietz and Duckworth (1976) stated the male genitalia of ***texana*** are indistinguishable from that of ***H. p. panthalon***, and that the female genitalia are also similar to each other. The larval foodplant is unknown. It is noteworthy to mention, that the ***Horama*** portion of Dietz and Duckworth's paper was submitted to the Department of Entomology, Cornell University, in partial fulfillment of the requirements for a Master of Science degree by the senior author. These authors state the type locality for ***texana*** is Texas, and the type specimen is presumably lost. These authors examined 208 males and 135 females of ***texana***. They listed the geographical range of ***texana*** as southern Texas, Florida, Arizona, Mexico, and Guatemala, and that adult ***texana*** specimens are consistently larger in size than those of the Caribbean populations of ***p. panthalon***.

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Dietz IV, R.E. and **W.D. Duckworth,** 1976. *A review of the genus Horama Hübner and reestablishment of the genus Poliopastea Hampson (Lepidoptera: Ctenuchidae).* Smithsonian Contributions to Zoology No. 215.

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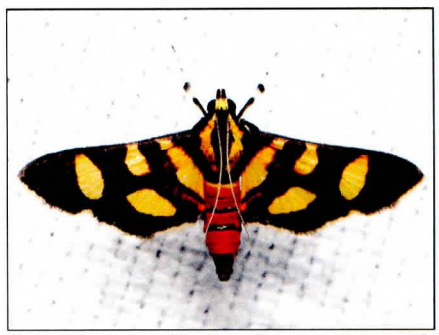
NEW FLORIDA KEYS LOCALITY RECORDS FOR *SYNGAMIA FLORELLA* (STOLL)

BY

LAWRENCE J. HRIBAR

The orange-spotted flower moth, *Syngamia florella* (Stoll) (Crambidae) is a small colorful moth that is found throughout much of the Americas (Heppner 2010). It is common year round in Florida (Kimball 1965) but likely less active during the winter months in northern Florida (Heppner 2010). Brou (2002) reported a peak flight time in October in Louisiana. Adults are thought to be diurnal (Heppner 2010) but Frost (1964) and Brou (2002) reported collecting adults in light traps. Nuñez Aguila (2004) reported collecting specimens both during the day and at night. Larval host plants are species in the family Rubiaceae (Heppner 2003). Adults can be abundant on flowers (Heppner 2010, Sivinski 2014). Previously reported Monroe County records (from Heppner 2010) are Bahia Honda Key, Big Cypress Preserve, and Key Largo. Big Cypress Preserve is on the mainland; the other localities are in the Florida Keys.



Orange-spotted flower moth (*Syngamia florella*) (Photo by Ken Childs).

A few specimens of *S. florella* were collected in traps set for routine mosquito surveillance. For each island where collections were made the date of collection and number collected is reported.

Grassy Key: 7 Dec 2015, 3; 29 Dec 2015, 2; 6 Jan 2016, 1; 11 Apr 2016, 2. **Long Key**: 2 Dec 2015, 1; 13 Apr 2016, 1; 15 Jun 2016, 1; 29 Jun 2016, 1. **Lower Matecumbe Key**: 30 Nov 2015, 1.

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[My thanks to Maury Heiman for contacting Ken Childs and acquiring the photo of *Syngamia florella* for publication in this article - The Editor.]

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TROTORHOMBIA METACHROMATA (WALKER, 1861) (LEPIDOPTERA: EPIPLEMIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

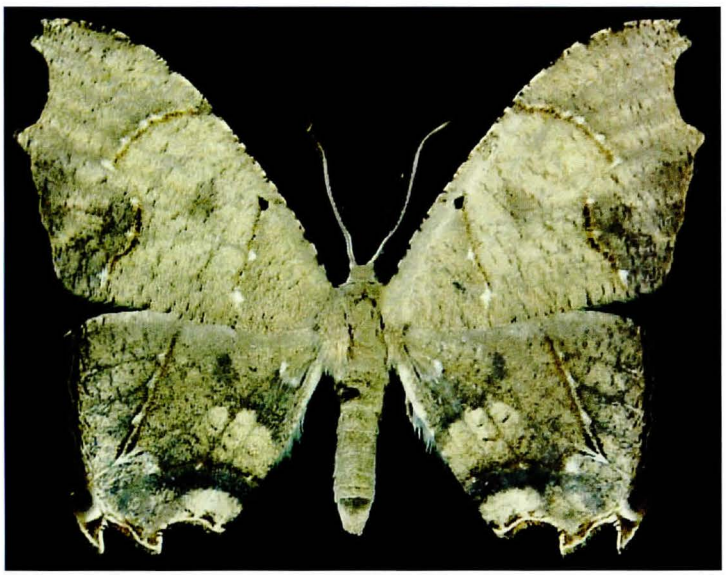

Fig. 1. ***Trotorhombia metachromata*** (Walker), male

Another new tropical species captured in Louisiana. On 2016, October 23, the first record of a moth of the family Epiplemidae, ***Trotorhombia metachromata*** (Walker) (Fig. 1) was captured in St. Tammany Parish, near the town of Abita Springs, the *Abita Entomological study site.

According to (Heppner *et al.*, 2007) this species was recently documented in the US from a single southern Texas record captured in flight, midday (about noon), in Hidalgo Co., at Estero Llano Grande State Park, near Weslaco, by the Mexican border. This single male specimen was taken on 20 September 2007 by C. Bordelon. Also, five adults of this species were captured in southern Florida, earliest known records from 1965-1968 and additional recent records. These older specimens captured in Florida were unreported and unrecognized prior to (Heppner *et al.* (2007). This species was originally described from the Dominican Republic (type locality). The known distribution includes, the West Indies, and parts of Central America, south to Brazil, (Heppner *et al.*, 2007). Gaede (1930), provided the known locations for this species as: Honduras, Puerto Rico, Venezuela, and Brazil.

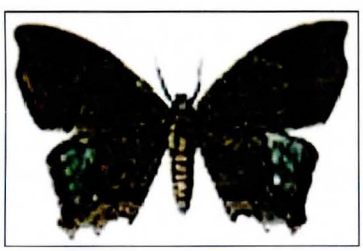

Fig. 2. ***metachromata***

In addition to the five specimens reported on by Heppner *et al.*, (2007), Hayden (per. comm.) indicates there are three additional Florida specimens: 1M: Dade Co. 4-iv-1983 P. Landolt, 1M: Broward Co. 16-vii-1983 M. Minno, 1M: Hillsborough Co. 26-v-2015 R. Freeman.

This species was not included for North America by Covell (1984) nor Heppner (2003). Heppner *et al.* (2007) reported ***metachromata*** was illustrated in Seitz by Gaede (1930) (Fig. 2). I have reproduced that image here (Fig. 2).

I thank James Hayden and John Heppner for most helpful information and comments concerning this species account.

* Abita Springs Entomological Study site: sec. 24,T6S, R12E, 4.2 miles northeast of Abita Springs, Louisiana.

NB: In Gaede (1930), the publication year of the Epiplemidae chapter in Vol. 6 is listed as 1936, but 1930 is on the volume's first page.

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(Vernon Antoine Brou Jr., 74320 Jack Loyd Road, Abita Springs, Louisiana 70420 ; E-mail: vabrou@bellsouth.net)

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Entomological visitors to Vernon and Charlotte Brou at the Abita Entomological Study Site
Jennifer M. Zaspel, (L) Assistant Professor of Entomology, Director Purdue Entomological Research Collection, and Crystal Klem, (center) Graduate Research Assistant, Zaspel Lab, Department of Entomology, Purdue University West Lafayette, Indiana, visiting Vernon (R) and Charlotte Brou (behind camera) at Abita Springs, Louisiana, on August 15, 2016. Purpose of visit was to sort through thousands of papered and spread specimens of ***Eudocima phalonia*** Linnaeus, from 22+ countries of the world, for a project involving population genetics.

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FIELD TRIP TO KISATCHIE NATIONAL FOREST, NATCHITOCHES PARISH, LOUISIANA

BY

VERNON ANTOINE BROU JR. AND RICKY PATTERSON

On September 1-3, 2016, Vernon A. Brou Jr. and Ricky Patterson from Vicksburg, Mississippi, ventured to a large wildflower-filled clearing Fig. 1, in the Kisatchie National Forest in Natchitoches Parish, Louisiana, for light trapping and daytime insect collecting. After dusk on our second night September 2, we were visited by Jeffrey Slotten who was already collecting in the area as well. Fig 2 shows Jeff (L), and Ricky (R) looking over some of the more interesting moths which were field-spread from our first night of light trapping. We operated 5 light traps, and our target were species the moth genus Schinia. Total figures (1-8).

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Ricky Patterson, 400 Winona Road, Vicksburg, Mississippi 39180; E-mail: rpatte42@aol.com)

SALBIA HAEMORROIDALES GUENÉE (LEPIDOPTERA: CRAMBIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

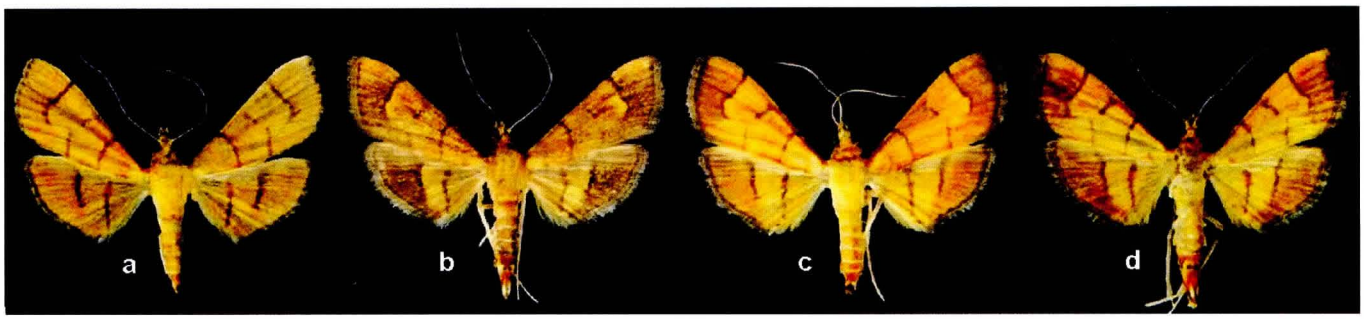

Fig. 1. ***Salbia haemorroidales*** phenotypes: males a-b, females c-d.

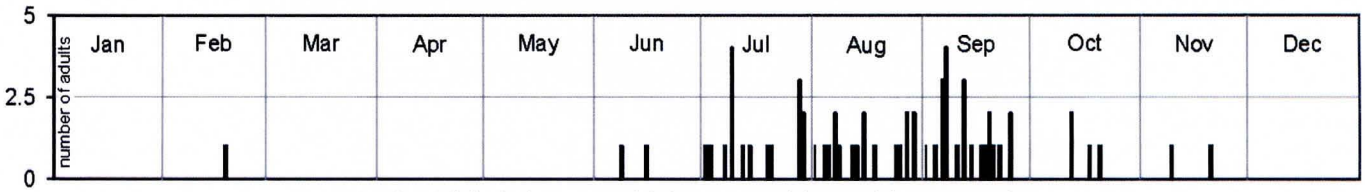

Fig. 2. Adult ***S. haemorroidales*** captured in Louisiana. n = 65

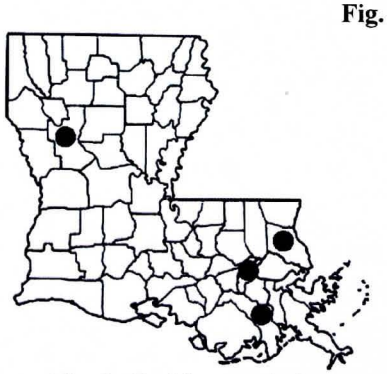

Fig. 3. Parish records for ***S. haemorroidales***.

The small pyralid moth ***Salbia haemorroidales*** Guenée (Fig. 1) is one of three species of the genus found in America north of Mexico (Scholtens and Solis, 2015). ***Salbia*** is a large genus containing over 35 species. Among a wealth of published agricultural, forestry, and research articles, ***haemorroidales*** is reported to be native to Central and South America, the Antilles, and southern U.S., and introduced to Hawaii, Queensland, and Mauritius, for control of ***Lantana camara*** L., the larvae of ***haemorroidales*** feed upon the leaves (Kueffer and Mauremootoo, 2004).

The noctuid moth ***Diastema tigris*** Guenée, found in Florida and Texas was also introduced as biological control of ***Lantana*** in Zambia, Australia, Micronesia, Fiji, Hawaii, Ghana, St. Helena, Tanzania, Uganda, and Mauritius (Kueffer & Mauremootoo, 2004). Rouillard and Guého (1999) also reported both ***tigris*** and ***haemorroidales*** were introduced into the Mauritius Islands as Biocontrôle agents.

Within Louisiana, ***haemorroidales*** makes its appearance as adults in late summer-early fall, primarily in the months of July-September (Fig. 2). Previously, Brou (2010) reported on the species, ***Omiodes indicata*** (Fabricius), which appears very similar to ***haemorroidales***, and both can easily be confused. ***O. indicata*** appears to have a single, more condensed brood than ***haemorroidales***, occurring mostly in the months of September - October. The overall upper surface color of the wings and body of ***indicata*** is more often, but not always, darker and more rusty in color. The upper forewings of ***indicata*** exhibit more substantial elongated reniform spot on each forewing, and most often exhibiting a very small orbicular spot on each forewing, these orbicular spots absent in the sample of ***haemorroidales*** taken in this study.

The parish records are illustrated in Fig. 3.

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Scholtens, B.G. , M.A. Solis, 2015. Annotated check list of the Pyraloidea (Lepidoptera) of America North of Mexico. ZooKeys 535: 1–136. doi: 10.3897/zookeys.535.6086.

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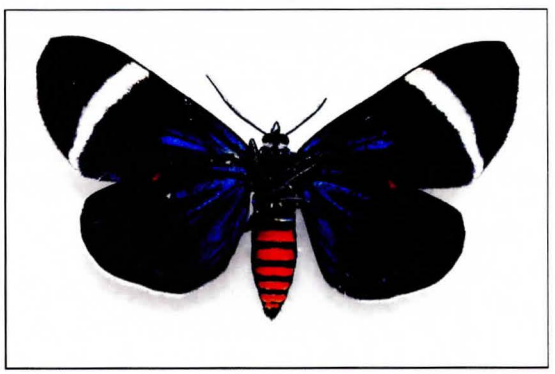
HYPOCRITA ESCUINTLA SCHAUS (EREBIDAE: ARCTIINAE) NEW FROM TEXAS

BY

MIKE A. RICKARD

The Pericopid moth *Hypocrita escuintla* was first recorded for the United States from a Florida specimen collected by Dale Habeck in 1989 (*Southern Lepidopterists' News* Vol. 29 No. 1, March 2007). On August 9, 2016, Jon McIntyre photographed an unknown moth he tentatively identified as this species, on a wall at Bentsen-Rio Grande Valley State Park in Mission, TX. He later found the moth dead on the sidewalk and I received the specimen. Examination by Ed Knudson confirmed it to be *H. escuintla*, with markings identical to that illustrated by Habeck. This represents a new state record for Texas. The specimen has been deposited in the Texas Lepidoptera Survey collection.

***H. escuintla* (dorsal)**



***H. escuintla* (ventral)**

(Mike A Rickard, E-mail: folksinger4@yahoo.com)

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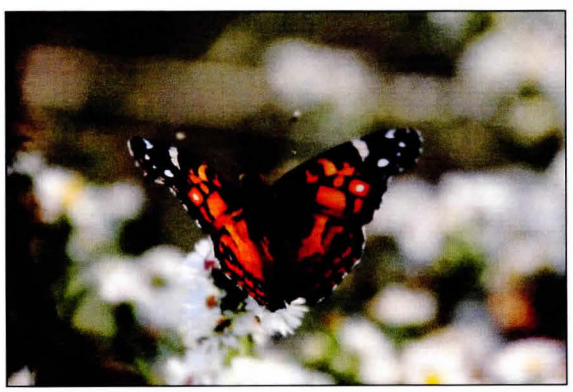

***Vanessa virgiensis* nectaring on aster (*Symphyotrichum pilosum*)(Cove Creek Rd., Washington County, Arkansas) (October, 2016) (Photo by David Rupe)**

YOU CAN'T CHANGE A LEONARD'S SPOTS, OR CAN YOU?

BY

CRAIG W. MARKS

In the last issue of Southern Lepidopterists Society News (Vol. 38, No. 3), I presented some observations and thoughts I had developed about the Dusted Skipper (*Atrytonopsis hianna*) in Louisiana, and, specifically, what appears to be intergrades between *A. h. hianna* and *A. h. loammi* found within that State. Recently, I stumbled on to another similar situation in Oklahoma involving the Leonard's Skipper (*Hesperia leonardus*) and intergrades between *H. l. leonardus* and *H. l. pawnee*.

Last year, I reported on a trip I made to Oklahoma with my Dad during which I was able to see my first Leonard's Skippers at McGee Creek Wildlife Management Area (WMA) near Stringtown OK (see SLS News, Vol. 38, No. 1). My friends, Jean and Jeff Trahan from Shreveport, had never seen a Leonard's Skipper. I had so enjoyed my time at that location that I volunteered to return to McGee Creek with them this year and see if we could not add that species to their life list. We ended up making the trip on Saturday, September 10, 2016, one year to the day after my previous visit.

As we drove north on the Indian Nation Turnpike toward McGee Creek, we passed through a fast moving front with very light rain. By the time we reached the WMA at about 11:15, while the temperatures were still in the low 70's, the skies were blue. Within 10 minutes of entering the actual WMA, I found a fresh male Leonard's Skipper on blooming thistle, and the Trahans got their "lifer." (see Figs. 1 and 4 below)

As the temperature rose, we began to see more and more butterflies, primarily skippers. As with the year before, there were numerous Crossline (*Polites origenes*) and Tawny-edged (*P. themistocles*) (Fig. 2) skippers. Southern Broken-dashes (*Wallengrenia otho*) and Southern Cloudywings were common. Also present were several fresh Delaware Skippers (*Anatrytone logan*) (Fig. 3, see next page). While some skippers were taking nectar at blooming boneset, the greater majority were seen at blooming thistle along the main north-south road through the unit, between parking lots 2 and 3. Along the way, I saw four different skippers caught by crab spiders on that thistle, a Crossline Skipper, a Southern Broken-dash, a male Leonard's Skipper and a male Byssus Skipper (*Problema byssus*). We saw a total of 26 species, including at least nine fresh Leonard's Skippers, probably more.

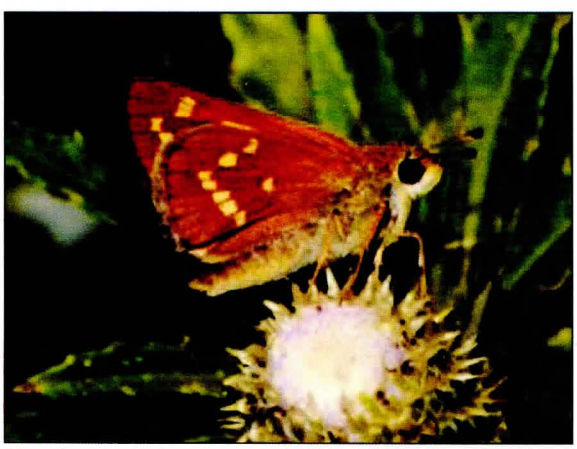

Fig. 1. Male Leonard's Skipper (September 10, 2016) (J. Trahan)

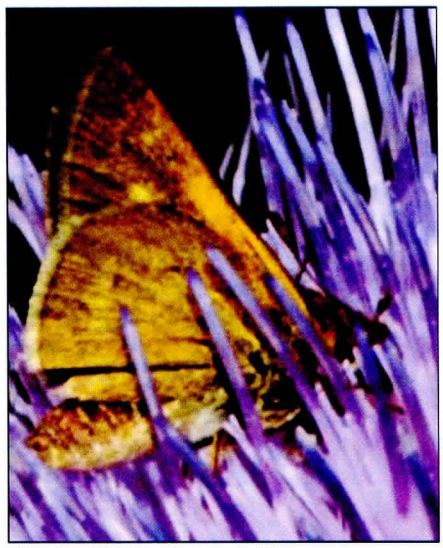

Fig. 2. Tawny-edged Skipper (September 10, 2016)(J. Trahan)

Throughout the day Jeff and I were closely inspecting each blooming thistle, hoping to maybe find a Dotted Skipper (*H. attalus*). I had seen very briefly a larger skipper with an unusual spot pattern ventrally, but it was gone before I could get a better look. About a half hour before we left, Jeff called me over to look at a skipper he couldn't identify. My initial impression was a Dotted Skipper but the color wasn't quite right, so I netted it. Jeff's picture (Fig. 4) is on the next page..

As presented in last year's article, the Leonard's Skipper ranges across the northern U.S, from Maine to the Dakotas, as well as extending southward into the Carolinas along the east coast and then into Oklahoma and Arkansas as the most southwestern extension of its range. In the south and the east, the subspecies is *H. l. leonardus*, while in the west (a transition line runs from Minnesota into Iowa), it is the much more plainly marked and lighter colored, *H. l. pawnee*, with intergrades along a midwestern contact zone (Cech and Tudor, 2005). Upon closer inspection of this specimen, I realized it was a Leonard's, and Jeff and I wondered if it might be the Pawnee subspecies.

Fig. 3. Delaware Skipper (September 10, 2016)(J. Trahan)

Again, the color didn't seem right so I sent the photos to John Fisher in Oklahoma and Kilian Roever. John indicated that he had also found specimens of Leonard's Skippers with non-typical spot patterns in Oklahoma. Kilian referred me to a couple of older articles that addressed geographical variations within the *H. leonardus* complex. The first was by Scott and Stanford (1981). The second was by Spomer and others (1993).

Historically, *H.l. pawnee* was considered by some to be a separate species. Three visually prominent differences distinguish *pawnee* from *leonardus*: ventral lower wing background color, lower wing spot pattern and lower wing spot color. The thrust of Scott and Stanford's article was that the two are conspecific with a north to south transition from *pawnee* to *leonardus*. They also identified a, "broad area of intergrade from Minnesota and Wisconsin to Manitoba and perhaps Iowa." I don't see that any Oklahoma specimens were evaluated during their study.

In their study of prairie-dependent butterflies, Metzler et al. (2005), included *H.l. pawnee* as separate from *H.l. leonardus*, characterizing the former subspecies as prairie-dependent while the latter was not. Their range map for *pawnee* reflected multiple records in Nebraska and Iowa, but nothing south of those states. They felt "most" of the records from the western part of the blend zone described by Scott and Stanford were the prairie-dependent subspecies while those from the eastern portion of that zone were not prairie-dependent.

Spomer et al. presented the results of a study of specimens from the Loess Hills of the Missouri River Valley from the southeastern tip of South Dakota to the northwestern section of Missouri. The authors ultimately agreed with Scott and Stanford's conclusion that *pawnee* and *leonardus* are conspecific. They further extended the "blend zone" identified by Scott and Stanford into western to southwestern Iowa and eastern Nebraska. Again, I don't see that any specimens from Oklahoma were included as part of this study.

Schlicht et al. (2007), relying heavily on the Spomer article, indicate the *pawnee* subspecies occurs along the western border in the four northern-most counties. The *leonardus* subspecies occurs in scattered locations in the southeastern portion of the state and the two southern-most counties on the western border. These subspecies, "completely intergrade in a genetic cline," within the three counties along the western border and between the northern and southern counties described above. As an aside, the pictures for these subspecies in this book are reversed, with *pawnee* identified as *leonardus* and vice versa. There are no intergrades depicted.

Spomer et al. reported no specimens were found in the Loess Hills of extreme northwestern Missouri, but commented that typical *H.l. leonardus* had been reported in the "Missouri Ozarks." The Heitzmans (1987) described this skipper as a "breeding resident in the Ozark region" which is generally defined as the lower third of the State, including the southwestern corner adjacent to northeastern Oklahoma. Their pictures depicted *H. l. leonardus* specimens, but one of those pictures appears to be a ventral picture of a female intergrade.

Field (1938) mentioned only one old record for Kansas, and regarded the species as a visitor. He didn't designate whether that specimen was *pawnee* or *leonardus*, but the description referenced reddish-brown hindwings, suggesting *leonardus*. Ely et al. (1986) presented records from four counties in Kansas, but none from the southern half of that state. They described the skipper as, "probably local in the northwestern 1/4". Betros (2008) reported records for *H. leonardus* from seven unidentified counties in Kansas and 13 in Missouri without mention of the subspecies, but the specimens depicted are *H. l. leonardus*. The picture in the Heitzmans' guide referenced above suggests intergrades similar to those found in Oklahoma are also present in western Missouri. I suspect there are also intergrades present in Kansas, but additional research is needed to confirm that suspicion

Fig. 4. Male Leonard's Skipper intergrade (September 10, 2016)(J. Trahan)

In Oklahoma, Dole et al. (2005), listed *H. leonardus* as a stray in Oklahoma, again without making mention of either subspecies or intergrades. Per John Fisher, the first record of this species was a single specimen from Payne County in north central Oklahoma (currently included as part of the Oklahoma State University insect museum). Since 2005, it has been found in three southeastern counties, Atoka (at McGee Creek), Latimer and McCurtain, with a high of 103 seen in mid-September, 2005, at McGee Creek.

I have never visited the Loess Hills, but from the description provided by Spomer et al., the habitat at the southern end of those Hills is somewhat similar to that surveyed at McGee Creek. The southern hills are

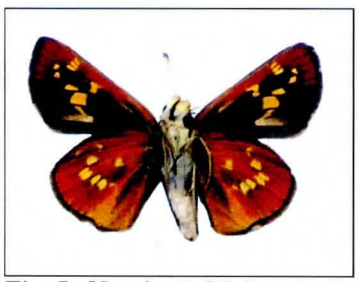

Fig. 5. Nominate Male

Fig. 6. Nominate Female (both September 10, 2016.

Fig. 7. Intergrade Male

Fig. 8. Intergrade Male (both September 10, 2016)

described as dominated by hardwood (such as bur oak) forest, consistent with the habitat at McGee Creek, a mixture of oak and hickory forests with stands of short-leaf pine, located in the Jack Fork Mountains. The terrain at McGee is rocky and moderately hilly. The typical habitat for this skipper in the Loess Hills included roadside ditches at the base of hills, again consistent with the situation at McGee. The habitat is definitely not open or prairie.

Before we left McGee, I found another specimen which I consider to be an intergrade. The differences between nominate *H.l. leonardus* and these intergrades are shown in Figs. 5-8 which depict, in sequence, a nominate male, a nominate female and the two intergrades (both males) seen on September 10, 2016. These photos reflect on the intergrades a distinctly different spot pattern, but the brick red background color and spot color seem to be the same.

John Fisher advised the intergrades he has seen in Oklahoma in the past were similar to what I had found. While some of the intergrades were lighter colored, none were as light as the *pawnee* ssp, with most possessing the coloring typical for the *leonardus* ssp. The primary variable was the ventral spots, differing in both size and color from what would be considered "normal."

My typical practice, when writing articles for the SLS Newsletter is to ask Jeff Trahan to act as my proofreader/editor. After reviewing my initial transcript, Jeff very cogently commented that with this skipper occurring in only a small portion of Oklahoma, primarily the southeast corner of that State, one might wonder how an intergrade between *pawnee* and *leonardus* could occur in such a small, isolated area where one of the subspecies (*pawnee*) does not appear to exist. Nevertheless, it does appear that the intergrades between *leonardus* and *pawnee,* in varying degree, extend beyond the Loess Hills of Iowa into southeastern Oklahoma.

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(Craig W. Marks, E-Mail: cmarks@landcoast.com)

Group photo of the joint meeting of the Southern Lepidopterists' Society and the Association for Tropical Lepidoptera in Gainesville, Florida (October 28-30, 2016)

PHOTOGRAPHS FROM THE SOUTHERN LEPIDOPTERISTS' SOCIETY 2016 ANNUAL MEETING

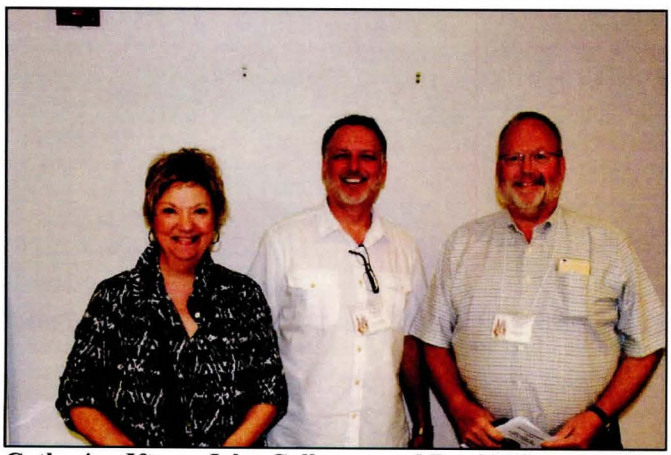
THE MCGUIRE CENTER FOR LEPIDOPTERA AND BIODIVERSITY, UNIVERSITY OF FLORIDA, GAINESVILLE (28-30 OCTOBER)

Welcome from the Saturday morning registration table: Elena Ortiz, Stacy Huber, and Kelly Dexter.

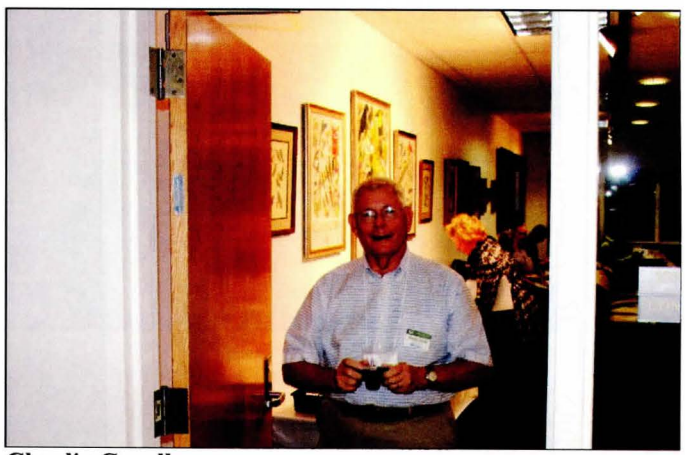
Eric Anderson and David Auth, behind - Bob Beiriger and Vijay Barve, back corner - John Douglass.

Break time in the meeting room. First row - Bill and Marcia Boothe, second row - Terry Arbogast.

Andy Anderson, Rick Gillmore, and Marc Minno.

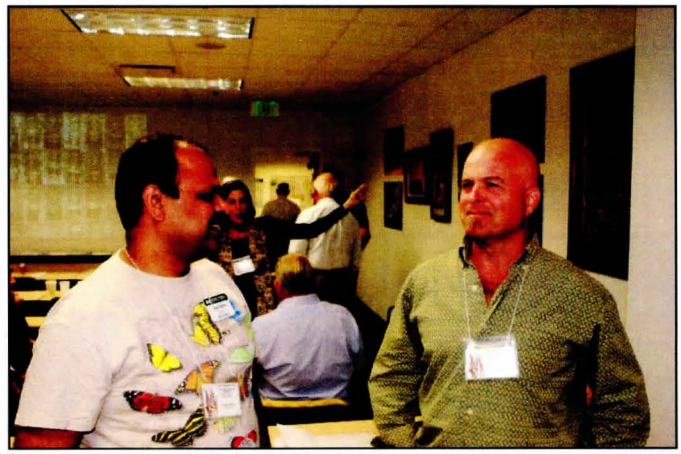


Catherine Iftner, John Calhoun, and David Iftner.



Charlie Covell.

John Douglass welcomes attendees at opening of Saturday morning session.



Vijay Barve and Eric Anderson.

Break time in the meeting room. First row - Dale Halbritter and Johnalyn Gordon, second row - John Pickering, Sharalee Dias, and Bert Dias, third row - Terry Arbogast and James Adams.

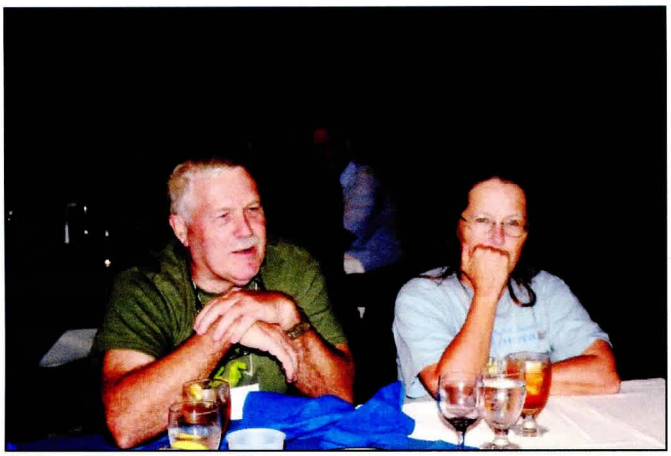
Break time in the meeting room. First row - Matt Blaine and Debbie Matthews.

Bill Berthet and Rick Cech.

Dona and Matt Blaine in McGuire Center reception area.

Rick Gillmore, Daniel Hyman, and Jeff Slotten at the annual banquet.

David Iftner, Catherine Ifner, Ruth Ann Peacock, and John Peacock.



Bill and Marcia Boothe.

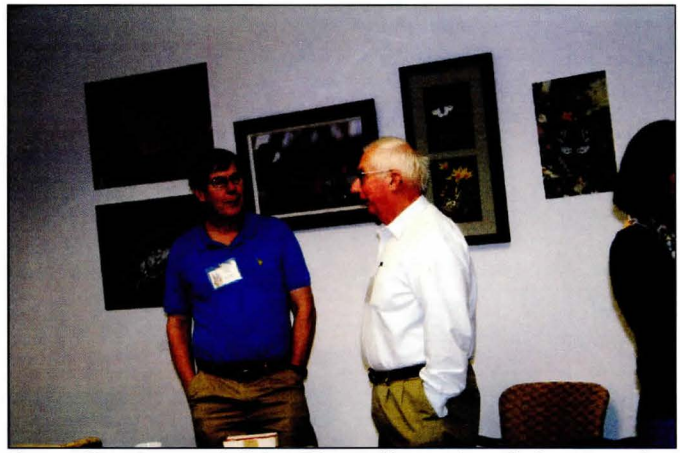
Ada Neal, Jaeson Clayborn, and Yadira Reynaldo.

Debbie Matthews and Bill Boothe showing off carnivorous plant T-shirts from the Florida Museum of Natural History gift shop.

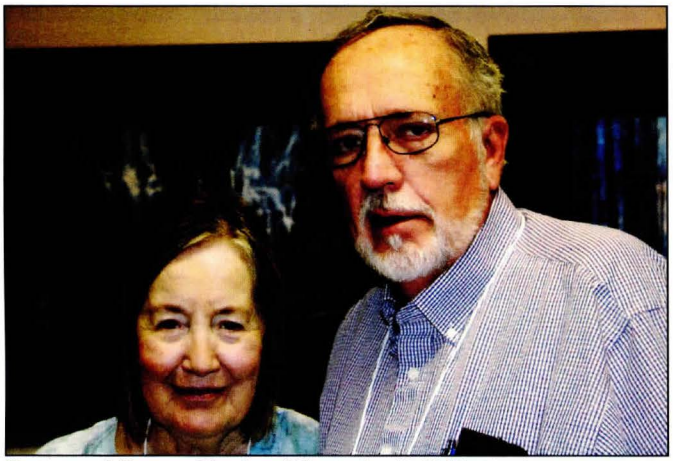
Joe Martinez PhD Student making presentation (Photo by Charlie Covell)

[Above Photos (including those on pages 270 and 271) were submitted by Andy Warren.]

Group of attendees including Tom Neal, John Douglass, Marc Minno and John Pickering during a break from the talks (Photo by Jeff Slotten).

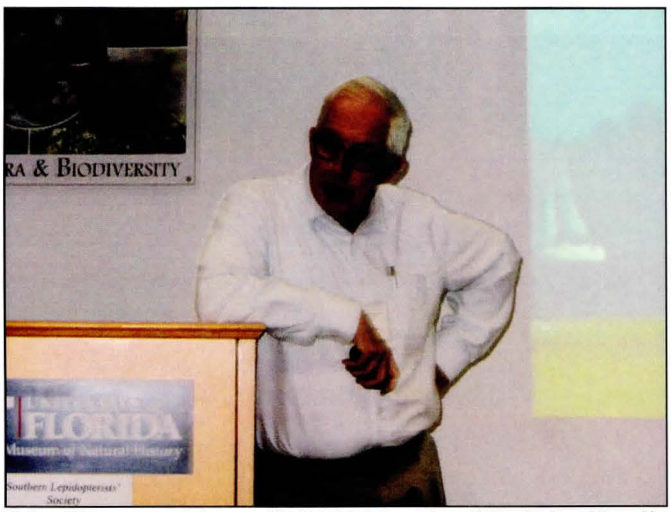


Lance Durden and John Hyatt discussing their upcoming talk on Sapelo Island, Georgia moths and butterflies (Photo by Jeff Slotten).



Betty and Leroy Koehn (Photo by Jeff Slotten).

Tom Emmel's Book Shop (Photo by Charlie Covell)



John Hyatt speaking at SLS 2016 meeting (Photo by Charlie Covell)

Tom Emmel welcoming everyone to the meeting (Photo by Charlie Covell)

[The first shall be the last - the Editor]

SLS MEMBERS PARTICIPATING IN A WEEKEND FIELD TRIP DURING THE ATL - SLS JOINT MEETING

Fig. 1. SLS Field Trip, Ocala National Forest, Florida, 28 Oct. 2016: J. Douglass, Bill Boothe, Matt Cousins, Lary Reeves, Matt Blaine, Brian Scholtens, Dona Blaine. Not shown: Marcia Boothe. Photo by Jim Monroe.

Fig. 2. John Douglass, Ocala National Forest, Florida, 28 Oct. 2016. Photo by Jim Monroe.

A CONVERSATION WITH MY DOCTOR

BY

F. MATTHEW BLAINE

A few weeks ago I had a checkup scheduled with my Doctor. As usual I take something to read while I am there to make the time that I spend in the waiting room useful. Sometimes I take PDFs of papers that I am interested in and sometimes I take a book to read. This time I had my copy of BUTTERFLY PEOPLE by William Leach. When I was called from the waiting room for my appointment I carried it with me.

After my checkup we talked and he asked me if I was an entomologist. He had seen the book that I brought with me and I explained to him that I was an amateur entomologist and that I was particularly interested in Lepidoptera. I told him that I had been interested in insects since I was a child. In 1972 I started collecting seriously. I have been collecting and studying insects ever since. I always attach the scientific data on a label below the insect on the pin. He said that he wanted to tell me a true story about himself when he was a young boy growing up in India. He said that he had never told this to anyone before.

When he was a child he lived in a village in a very hot part of India. When he got home from School he liked to stay outside of his home and play but he had to do his homework every night. He tried to study inside his home but it was so hot that he could not concentrate so he took a small lamp and his homework outside where it was cooler. He sat on the ground with his lamp and homework in front of him. It was still very hot even after dark so he only wore a loin cloth to keep as cool as possible. He found that he was able to work this way but the first night, as time went on, he saw moths and beetles were attracted to his light. He continued to work and as he did moths began to land on his body. They eventually covered him from head to toe. They tickled and irritated him but he tried to concentrate on his homework. When his mother came out to bring him a glass of milk as a treat for his hard work she was amazed to find him covered in moths! He kept on doing his homework this way for several nights but found the tickling very distracting. He asked his father what he could do to eliminate the annoyance. His father told him to pray for help and to ignore the insects. He did this every night and eventually he could do his homework covered in insects without noticing them being there!

His tenacity and his father's good advice obviously worked because he not only did well in elementary school but he continued his education and eventually became a medical doctor. I was privileged to have been told this enchanting true story about the early education of a young boy in a distant land where things that we now take for granted like air conditioning did not exist but where tenacity and the desire to learn prevailed.

Credits - Piyush Yoshi M.D. for sharing this story with me and giving me permission to share it with others.

(F. Matthew Blaine, Curatorial Associate, Delaware Museum of Natural History,
Research Associate, The Florida State Collection of Arthropods,
Research Associate, The McGuire Center for Lepidoptera and Biodiversity at the Florida Museum of Natural History,
University of Florida)

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ATEGUMIA EBULEALIS (GUENÉE, 1854) (LEPIDOPTERA: CRAMBIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

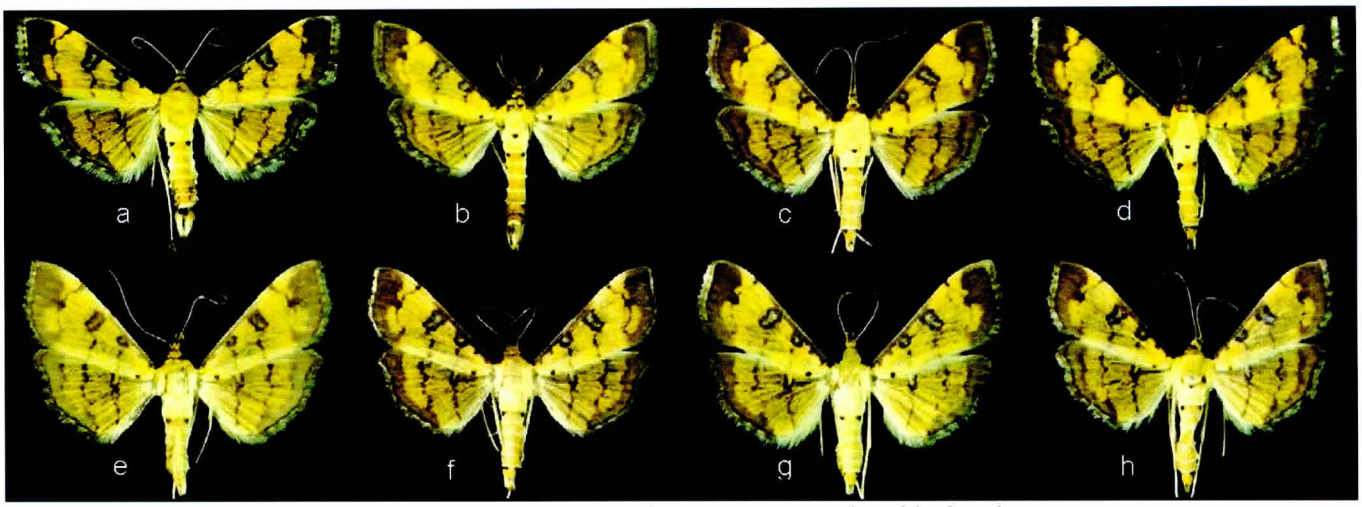

Fig. 1. ***Ategumia ebulealis*** phenotypes: a-c. males, d-h. females.

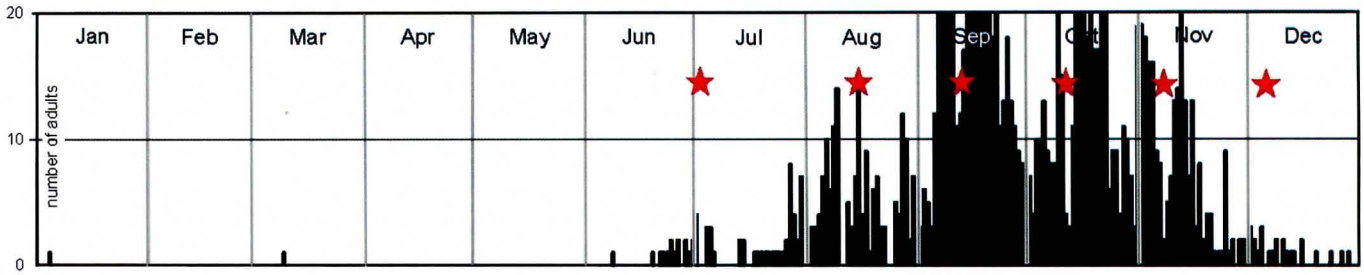

Fig. 2. Adult ***Ategumia ebulealis*** captured in Louisiana. n = 1,440

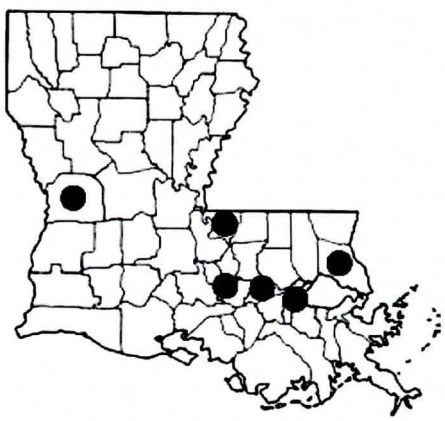

Fig. 3. Parish records for ***A. ebulealis***.

The very small yellow and black pyralid moth ***Ategumia ebulealis*** (Guenée) (Fig. 1) is commonly encountered in ultraviolet light traps in southeast louisiana. Scholtens and Solis (2015) validated the genus ***Ategumia*** Amsel, 1956, and the species name ***ebulealis*** (Guenée, 1854). This species was not covered by Covell (1984), nor Powell and Opler (2009), though is appears to be found primarily in and across the Gulf States. Heppner (2003) listed the range of ***ebulealis*** to include: Georgia ? to Florida and Louisiana to Texas, West Indies to Venezuela ?

Within southeast Louisiana, there are 6 annual broods occurring during the latter half of the year, the first brood peaking end of June/early July, the second brood peaking about mid-August, with four subsequent broods peaking at 28-day intervals (Fig.2). The parish records are illustrated in Fig. 3.

Reported in several counties in *'South Carolina Moth Species*' web portal (2016). Also reported from Emanuel Co., Georgia (Adams, 2010). Also listed for state of Florida, in *Florida Lepidoptera Index* (November, 2000). Reported and illustrated for the country of Belize, a specimen determined by noted Pyralid researcher Eugene Munroe, in web portal *Moths of Belize* (2016) and also listed for Belize at web portal Focus on Nature.

Also listed for the state of Hawaii in *'Arthropods of Hawaii'* web portal (March, 2003), and Wikipedia web portal (2016). But, according to Wikipedia (2016) researchers actually introduced to Hawaii the similar looking species ***Ategumia matutinalis*** (Guenée, 1854) for the control of the invasive plant ***Clidemia hirta*** (L.) D. Don. Researchers thought they were introducing ***ebulealis.*** I thank Charles M. Allen for supplying the Vernon Parish records for ***ebulealis.***

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(Vernon Antoine Brou Jr., 74320 Jack Loyd Road, Abita Springs, Louisiana 70420 USA; E-mail: vabrou@bellsouth.net)

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Hybrid pitcher plant, *Sarracenia leucophylla* X *S. flava* var. *rugelii*, Baldwin Co., Alabama. Photo Barry McPhail (SLS Spring 2016 Field Trip).

POLLINATION CELEBRATION: A NEW FESTIVAL FOR LOUISIANA

BY

GARY NOEL ROSS

On September 24, 2016, a new nature-based festival premiered in Louisiana. The stimulus was the alarming decline in honey bees throughout the world and Monarch butterflies throughout North America. Titled "POLLINATION CELEBRATION," the event was sponsored by the Tangipahoa Parish Master Gardener Association (TPMGA), a 60-member, non-profit organization headquartered in Amite, LA. The location for the event was the LSU AgCenter Hammond Research Station, a 140-acre state facility within the piney woods just east of Hammond—a college-based community about 40 miles east of Baton Rouge and the same distance north of New Orleans. The station fronts Old Covington Highway, a major thoroughfare that connects U.S. Hwy. 190 with Interstate 12, and so is easily accessible. The setting is picturesque: A lengthy, conspicuous white pollard fence defines the property while the entranceway is flanked by two massive live oak trees. The trees are registered with the Live Oak Society of the Louisiana Garden Club Federation, Inc. ["Edna Szymoniak Live Oak" (#2072) with a recorded girth of 29.0 feet, and "Boleslaus Szymoniak Live Oak" (#2071) with a recorded girth of 18 feet.] Although the actual age is unknown, trees of this size are usually 400-500 years old. For decades, these historic stalwarts have been a popular regional landmark.

The research station was established in 1922 to conduct research on strawberry and truck-crop farming—popular occupations in the area. Today, however, the station specializes in ornamental horticultural research, including the selection of plants to be recommended each year as "Louisiana Super Plants." To encourage the public to visit, the grounds are open each day free of charge.

Fig. 1. Setting for "Pollination Celebration." Site is part of the Louisiana State University system located in Hammond. Tree is the historic "Edna Szymoniak Live Oak"; limbs are carpeted with resurrection fern (*Pleopeltis polypodiodes*), a common epiphyte.

Fig. 2. "Edna Szymoniak Live Oak," one of a pair of historic trees at entrance to station in early morning fog. The official girth is 29.0 feet as registered with the Live Oak Society, Louisiana Garden Club Federation, Inc. Age is estimated between 400-500 years.

The Tangipahoa Parish Master Gardeners were elated to acquire the association of the LSU AgCenter Hammond Research Station as the site for its "Pollination Celebration." Planning for the festival began nearly a year in advance. Because I bear the title "Director of Butterfly Festivals" for the North American Butterfly Association (NABA), and because I live in Baton Rouge, I served as the professional consultant. The agenda was ambitious. The date selected coincided with maximum populations for insects and a surge of migrating Monarch butterflies. In the end we decided on an event that would be advertised as "An Educational Experience for All Ages."

Fig. 3. Headquarters and Reception Center for station. Conference room was one of two indoor facilities used for professional presentations.

Once a date was finalized, advertisement began. Several local sponsors contributed funds and the LSU Ag Center provided access to all their facilities and personnel. Printed materials included flyers, two-sided bookmarkers, yard signs, electronic ads, and newspaper articles. A t-shirt (title and hummingbird images on front, names of sponsors on back) was designed and marketed to TPMGA members. Chairperson of the festival committee, Sheryl Chipley Till, along with yours truly were interviewed on live radio and television programs in Hammond, Baton Rouge, and New Orleans. Art organizations within the area were solicited to participate in an art contest: photos, paintings, sculpture, etc. that feature pollinators. Entries would be judged by experts and the winning entry would be announced at a pre-festival dinner and auction. To encourage entries, the committee hoped to incorporate some part of the winning design into the logo for a future festival. In the end, 15 pieces were entered. Winner? A painting of a bumble bee on a purple coneflower. It was purchased by a member of TPMGA.

Yet, the festival almost didn't happen. In mid August, southeast Louisiana experienced historic record flooding due to heavy rains from a stalled weather system in the northern Gulf. Many areas received between 25 and 31 inches of rain within 48 hours. Meteorologists estimate that 7 trillion gallons of water fell in the region, more than during any hurricane in recorded history. All surrounding waterways topped their banks and remained in flood stage for a week or more. The Hammond region was close to the epicenter so that the research station was not spared. Although all buildings escaped, much of the flower beds with tender vegetation were inundated. But as soon as the waters receded, employees raced to clean flower beds of debris and to replant. Because of such diligence, TPMGA decided to continue with plans to launch the festival just one month later.

Saturday September 24. Gates opened at 8:15 AM. Programming began at 9:00, extending to 3:00 PM. An entrance fee of $10.00 was charged per vehicle—regardless of number of occupants. For busses, the fee was $2.00 per person. The day was partly cloudy, rainless, but hot with the afternoon temperature peaking at 92 degrees F. The grounds were pristine with no evidence of recent past flooding. Large, colorful flower beds displayed a an assortment of annuals and perennials, nectar plants for bees and butterflies, and host plants for several species of butterflies (Monarch, Gulf and Variegated Fritillary, Pipevine Swallowtail, Giant Swallowtail, Gray Hairstreak, and several species of sulphurs).

On point, the day featured "activities for all ages." Two air-conditioned buildings served for formal presentations by professionals from around the state. Topics included: History of the Research Station, Plant Pollination, Effects of Pesticides on Pollinators, Native Plants and Their Importance to Caterpillars and Nectar for Butterflies and Moths, and Why Vegetable Gardens Need Pollinators. I presented my special 30-minute

Fig. 4. Hard-copy poster used for advertisement.

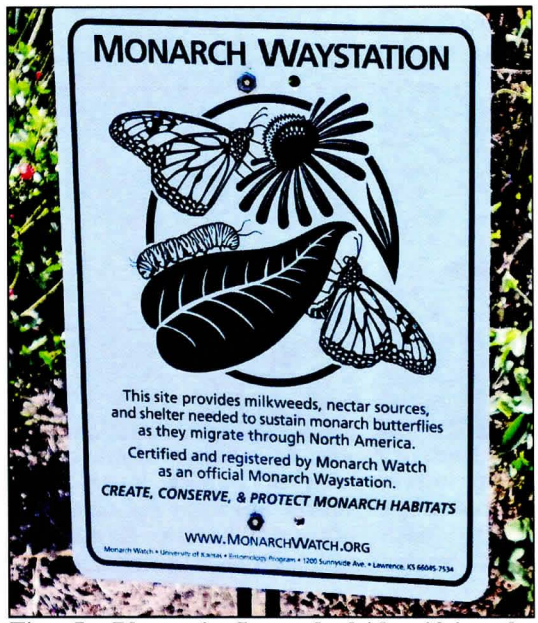

Fig. 5. Plaque in flower bed identifying the site as an official "Monarch Waystation." Bed featured both native and exotic milkweeds, all hosts for the Monarch butterfly.

Fig. 6. Partial view of grounds on day of "Pollination Celebration."

Fig. 7. Electronic advertisement for the Internet.

Fig. 8. Giant milkweed/crown flower (*Calotropis gigantea*, Family Apocynaceae), a robust species native to Southeast Asia and tropical Africa. Plant can grow to 13 feet in native habitats. Flowers are popular in leis in Hawaii.

Fig. 9. Monarch caterpillar on giant milkweed. Female Monarchs lay eggs on fresh leaves. Older leaves are relatively tough and thick; they are avoided by butterflies.

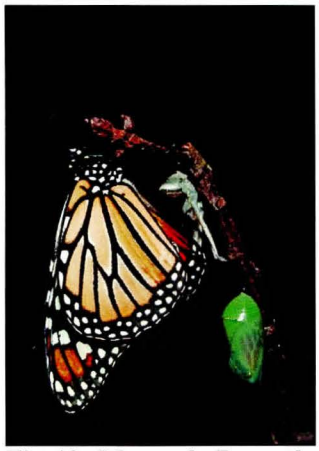

Fig. 10. Monarch: Recently eclosed (emerged) adult, spent chrysalis, and pupa (fresh chrysalis) with developing adult visible inside.

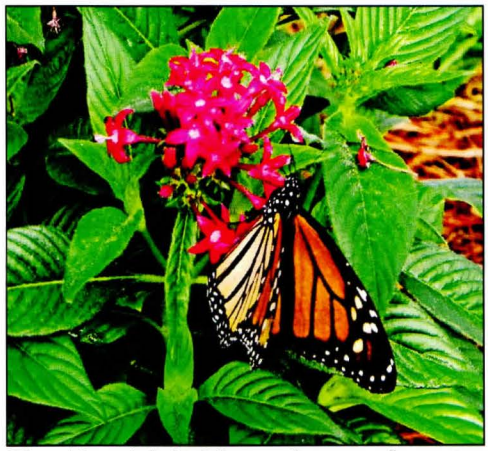

Fig. 11. Adult Monarch on red pentas (*Pentas*, Family Rubiaceae), a favorite source of nectar for many butterflies and other pollinators. Butterfly was common although no migration was observed.

Fig. 12. Male Pipevine Swallowtail butterfly (*Battus philenor*) on native milkweed (*Asclepias tuberosa*) often called "butterfly weed." Photograph from Mt. Magazine, Arkansas. *A. tuberosa* does not perform well in the damp, heavy soils of south Louisiana.

Fig. 13. Sarah Rayner (center) speaking about pasasionflower vines (*Passiflora*, Family Passifloraceae) as hosts for Gulf Fritillary (*Agraulis vanillae*) butterfly and Variegated Fritillary butterfly (*Euptoieta claudia*). (INSET: Plaque identifying plant as a hybrid *Passiflora*. Two species of *Passiflora* are native to Louisiana. The more common, *P. incarnata*, is called "maypop." Fruits can be used to make jelly.)

Fig. 14. Larva of Gulf Fritillary on *Passiflora*. Spines are not poisonous, only a bluff for protection.

Fig. 15. Chrysalis of Gulf Fritillary camouflaged as a rolled dead leaf.

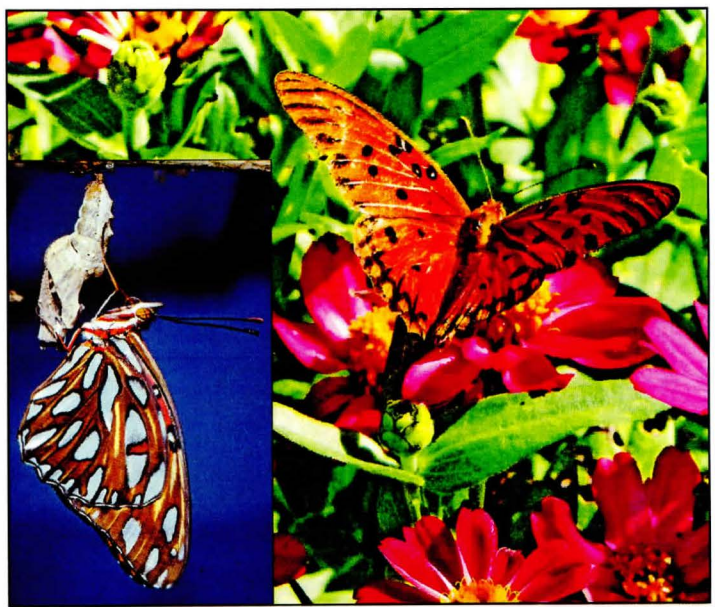

Fig. 16. Adult Gulf Fritillary on zinnia "Zahara" (*Zinnia*, Family Asteraceae). (INSET: Recently eclosed adult Gulf Fritillary and spent chrysalis. Butterfly was abundant.)

Fig. 17. Bed of blue saliva/sage (*Salvia farinacea*, Family Lamiaceae) and coral porterweed (*Stachytarpheta jamaicensis*, Family Verbenaceae). Both are excellent sources of nectar. [INSET: Close up of coral porterweed with a nectaring female Spicebush Swallowtail butterfly (*Papilio troilus*) — a look-alike for a female Pipevine Swallowtail. *P. troilus* was not common.]

Fig. 18. Candelabra bush/candlestick tree (*Cassia alata*, Family Fabaceae) is a fall-blooming, fast growing tropical American woody plant that serves as host to most sulphur butterflies (Family Pieridae) and the Gray Hairstreak butterfly (*Strymon melinus*), a small butterfly with hair-like appendages on its hindwings. [INSET: Close-up of inflorescence of *C. alata* with a leaf-footed bug (*Septoglossus phyllopus*, Family Coreidae). Although this is a sap-sucking pest on many commercial crops, the insect is also an indirect pollinator.]

Fig. 19.

Fig. 20.

Fig. 19. Satsuma (*Citrus reticulate*, Family Rutaceae) in fruit. All varieties of citrus serve as hosts for the Giant Swallowtail butterfly (*Papilio cresphontes*). (INSET: Young larva of Giant Swallowtail. Youngsters mimic bird droppings to escape predators.)

Fig. 20. Mature larva of Giant Swallowtail. Known as "Orange Dog" because of the citrus host and the expanded thoracic segments. Caterpillar mimics lichens for protection. In citrus orchards the caterpillars are considered a pest. Trees, however, are never completely defoliated.

Fig. 21. Chrysalis of a Giant Swallowtail. Pupa mimics lichens on tree branches and trunks.

Fig. 22. Adult Giant Swallowtail, regarded as the largest butterfly species in the United States. Butterfly was uncommon.

Fig. 21.

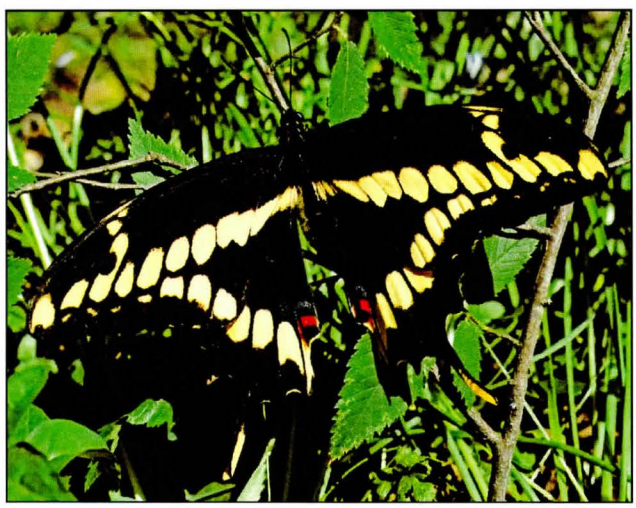

Fig. 22.

Fig. 23. Caterpillar of Cloudless Sulphur (*Phoebis sennae*) on native partridge pea (*Chamaecrista fasciculata*, Family Fabaceae). This is a fall-blooming legume common in waste places throughout most of the eastern United States.

Fig. 24. Harp-like chrysalis of Cloudless Sulphur.

Fig. 25. Recently eclosed adult Cloudless Sulphur and spent chrysalis. Butterfly was common.

Fig. 26. Turks cap (*Malvaviscus arboreus* var. *Drummondii*, Family Malvaceae). Prolific bloomer native to tropical America and southern Texas. Tight corollas are difficult for insects to access, but easy for hummingbirds. Bees can use their mandibles to bite into the basal part of the corolla to access nectar.

Fig. 27. Blue mistflower (*Conoclinium coelestinum* var. *Greggii*, Family Asteraceae) with a nectaring honey bee. Parent plant is native to southern Texas.

multi-media program titled "An Enchantment of Wings" four times during the day.

Outside, a local high-school student conducted a guided tour through the gardens several times during the day to point out pollinator-friendly plants—especially milkweeds in the officially registered "Monarch Waystation." Additionally, 17 tented-booths were scattered throughout the gardens and staffed by experts. Demonstrations and activities included:

- Local beekeeper demonstrating "dos and don'ts" for setting up a bee hive;
- Demonstration of a technique of photographing pollinators.

- Honey bee enthusiast conducting a taste-survey on samples of honey from different plant sources;
- Butterfly experts from Baton Rouge and New Orleans providing hands-on experiences for children (and adults) who wished to learn about butterflies and how to raise them for later release into the environment;

Fig. 28. Spider flower/cleome (*Cleome*, cultivar "Señorita Rosalita," Family Cleomaceae), a tropical/subtropical species. Cleome is an ornamental host for Great Southern White butterfly (*Ascia monuste*); the natural host is Virginia pepperweed (*Lepidium virginicum*, Family Brassicaceae), often abundant in dry waste places—even cracks in sidewalks. In Louisiana, the butterfly is normally only a coastal species. But in early 2016, the butterfly experienced a population explosion that resulted in a massive northward emigration. The butterfly was common at the research station all summer, but by festival time most butterflies had departed leaving behind defoliated cleomes. (INSET: Great Southern White male nectaring on zinnia "Zahara.")

- Registered expert on hummingbird banding from nearby Covington, LA demonstrating her art;
- Hands-on activity for making tubular houses for mason bees;
- Hands-on activity for creating container gardens;
- Hands-on activity for making butterfly wind spinners;
- Hands-on activity for making hummingbird feeders;
- Hands-on activity for planting seeds;
- Hands-on activity involving kids coloring images of butterflies;

As with most festivals, a number of vendors participated. Six local food entrepreneurs sold food and drinks and 25 others marketed everything from plants and nature-based crafts to the newest garden and farm equipment to assist gardeners.

Fig. 29. Bed of zinnia "Zahara," a popular neactar plant for many butterflies. (INSET: Male Great Southern White with wings extended basking on a zinnia "Zahara" flower. Tips of butterfly's antennae are blue.)

The research station proved to be an excellent host for a festival that championed pollinators. During a brief noon-time walk about the grounds and again during a three-hour walk two weeks later, I was amazed at just how many butterflies were present. I recorded 24 species. In descending order of abundance with a "1" indicating only a single individual, the species were: Gulf Fritillary (*Agraulis vanillae*), Cloudless Sulphur (*Phoebis sennae*), Common Buckeye (*Junonia coenia*), Monarch (*Danaus plexippus*), Pipe-vine Swallowtail (*Battus philenor*), Long-tailed Skipper (*Urbanus proteus*), Ocola Skipper (*Panoquina ocola*), Giant Swallowtail (*Papilio cresphontes*), Little Sulphur (*Eurema lisa*), Fiery Skipper (*Hylephila phyleus*), American Painted Lady (*Vanessa virginiensis*), Horace's Duskywing (*Erynnis horatius*), Common Checkered Skipper (*Pyrgus communis*), Great Southern White (*Ascia monuste*), Sleepy Orange (*Eurema nicippe*), Whirlabout Skipper (*Polites vibex*), Sachem Skipper (*Atalopedes campestris*), Eufala Skipper (*Lerodea eufala*), Silver-spotted Skipper (*Epargyreus clarus*), Spicebush Swallowtail (*Papilio troilus*), Red Admiral (*Vanessa atalanta*) 1, Carolina Satyr (*Hermeuptychia sosybius*) 1, Brazilian Skipper (*Calpodes ethlius*) 1, and Gray Hairstreak (*Strymon melinus*) 1.

Of these, the most noteworthy is the Great Southern White. The species is common throughout the American tropics as far south as Argentina, and in subtropical southern Florida and southern Texas. In Louisiana *A. monuste* is normally a breeding resident only along the southern coast (Grand Isle and Cameron, for examples). There, individuals can be found usually in low numbers. But occasionally and unpredictably, the species undergoes a population explosion, that is, an extraordinary number of individuals are produced—and survive — within a few generations. Such numbers

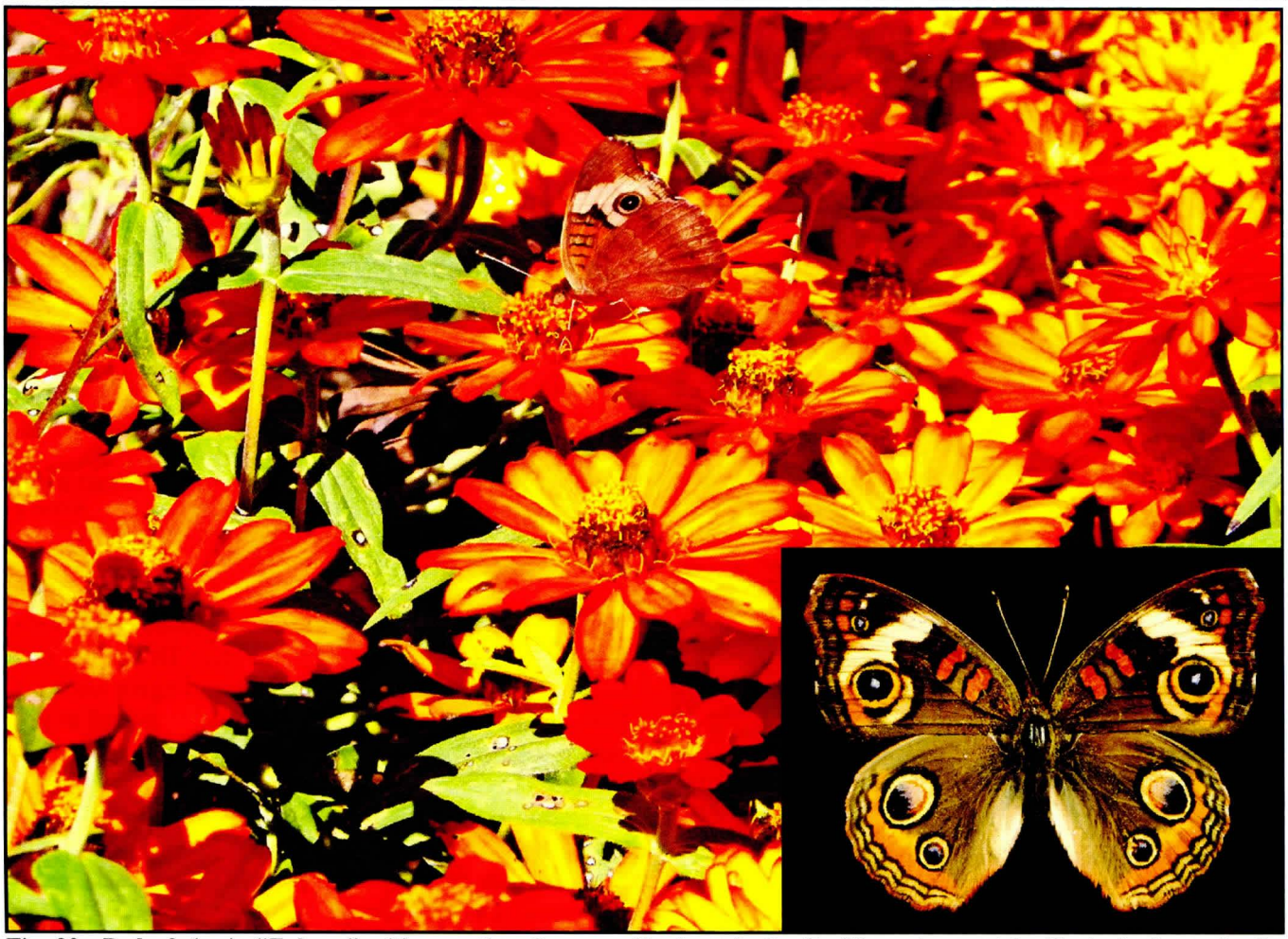

Fig. 30. Bed of zinnia "Zahara" with a resting Common Buckeye butterfly (*Junonia coenia*). Host plants are in the plantain and snapdragon families (Plantaginaceae/Scrophulariaceae), including spring snapdragon (*Antirrhinum majus*) and summer snapdragon (*Angelonia angustifolia*); several species of related field wildflowers serve as natural hosts. Butterfly was abundant. (INSET: Close-up of a preserved specimen of Common Buckeye butterfly dramatizing kaleidoscopic coloration.)

Fig. 31. Firebush (*Hamelia patens*, Family Rubiaceae) and festival attendees. Plant is an important nectar source for swallowtail butterflies and bees. Firebush also serves as a host for the Tersa Sphinx moth (*Xylophanes tersa*). A white Angel's trumpet (see Fig. 32) is in extreme right. [INSET: Close-up of bumble bee (*Bombus*), biting into the tubular corolla of firebush to access nectar. Flowers of Mexican cigar (*Cuphea,* Family Lythraceae) are similarly constructed and similarly accessed by bees.]

Fig. 32. Angel's trumpet (*Brugmansia arborea*, Family Solanaceae). Common relatives include Jimsonweed (*Datura*), tomato, potato, eggplant, and tobacco. Cultivars feature different flower colors and configurations. Most are fragrant from evening to dawn to attract crepuscular and nocturnal pollinators such as moths and bats. Species can serve as a host for Pink-spotted Hawk Moth (*Agrius cingulatus*); larva is the Sweetpotato Hornworm, a major pest for agriculture.

Fig. 33. Canna lily (*Canna*, Family Cannaceae), a tropical/subtropical group related to bananas and gingers, not lilies. Young growth is attacked by two species of Lepidoptera: the "larger canna leaf roller" — larva of the Brazilian Skipper butterfly (*Calpodes ethlius*), and the "lesser canna leaf roller"—larva of the grass moth *Geshna cannalis* (Family Crambidae = Pyralidae). Moth is more common, but both species inflict cosmetic damage.

Fig. 34. Flowering tobacco (*Nicotiana,* Family Solanaceae). Cultivars produce flowers in white, pink, or red. Most produce aromas from evening to dawn to attract crepuscular/nocturnal moths and bats. Host plant for Gray Hairstreak butterfly and Carolina Sphinx Moth (*Manduca sexta*); larva of the moth is the Tobacco Hornworm, the most common pest of tomato plants in southern states.

Fig. 35. Station hosted by Ken Bosso (right) of "Baton Rouge Butterfly Enthusiasts." Ken enjoys raising and photographing butterflies; he spent the day identifying butterflies in the gardens.

Fig. 36. Sign identifying location with experts demonstrating butterfly husbandry.

Fig. 37. Exhibit of Sarah Rayner (Baton Rouge), a retired school teacher and butterfly enthusiast who specializes in raising caterpillars into butterflies.

Fig. 38. Sarah Rayner sharing her experiences with visitors.

Fig. 39. Linda Barber Auld, "The BugLady" of New Orleans, explaining the biology of the Monarch butterfly. Linda, who volunteers at schools to assist with establishing butterfly gardens, also marketed her personal packets of native milkweed seeds.

Fig. 40. Child constructing a hummingbird feeder from an empty plastic soda bottle.

Fig. 41. Exhibit demonstrating art of potting seeds to facilitate germination.

Fig. 42. Exhibit of Linda Barber Auld.

Fig. 43. Exhibit demonstrating the art of potting seeds to facilitate germination.

Fig. 44. Young girl and her family observe Linda Beall, a registered professional for banding hummingbirds, working with a hummer caught in a garden trap.

Fig. 45. Young boy constructing a bamboo tube nest for mason bees (*Osmia*, Family Megachilidae). Several species are native to North America. Bees are solitary, using existing holes in reeds or wood to nest. Each nest contains a mass of pollen/nectar for larval food and a single egg. Holes may contain several nests arranged "apartment-style"; when complete, the entrance is sealed with mud. Mason bees produce no honey or wax.

Fig. 46. Local beekeeper, Steve Hoover, educating visitors on the art of raising honey bees.

Fig. 47. Poster illustrating varieties of bees and their role in pollination.

Fig. 48. Sign identifying site devoted to butterfly photography.

Fig. 49. Flower of bolo bolo (*Clappertonia ficifolia*, Family Malvaceae), an exotic species native to tropical Africa and related to hibiscus. Honey bee is pictured as it searches for nectar and pollen.

Fig. 50. Bumble bee nectaring on blue porterweed, a favored food source for most pollinators.

Fig. 51. Bumble bee visiting blue salvia/sage (*Salvia farinacea* "Rebel Child.")

Fig. 52. Honey bee visiting blue salvia/sage (*Salvia farinacea* "Rebel Child.")

Fig. 53. Close-up of candle-like inflorescence of *C. alata* as a honey bee (*Apis mellifera*) attemps to gain access to a flower.

exhaust native hosts. The crowding seems to trigger a response to search for food away from their normal breeding habitat. In what is called a "migratory phase," individuals move northward, often as far afield as the southern borders of the Great Lakes. As the butterflies emigrate, females search out new host plants to lay eggs for another generation. Needless to say, this gives butterfly enthusiasts throughout the cone of emigration, a treat. Having evolved in geographies with year-round warmth—meaning no need to hibernate during a cold season—the prolonged freezes in the newly invaded northern lands soon kill off the new immigrants. And that's that—at least until another population explosion occurs along the Gulf Coast.

In mid May of this year I was engaged in research in Louisiana's southwest Cameron Parish (see REFERENCES). At the time *A. monuste* was extraordinarily abundant. Most individuals were not visiting flowers, to the point that I could not acquire any photographs. The butterflies instead were actively flying in a more or less northerly direction. Upon my return to Baton Rouge a week later, I learned that butterfly enthusiasts throughout the state were observing a "strange white butterfly" flying not only in their gardens but in metropolitan areas as well (Baton Rouge city limits, for instance). Also, during my pre-festival visits to the LSU Ag Center Hammond Research Station in mid and late summer, I observed that the butterfly was abundant and actually breeding on "spider flower" (*Cleome*), an herbaceous annual often included in southern gardens for its profuse, ornamental flowers. (*Cleome* belongs to the family Cleomaceae, formerly, Capparaceae, a family that serves as the preferred host for the butterfly.) But at festival time, I observed only two males, probably from a generation on the *Cleome*, which at this time, had been totally defoliated—presumably by larvae of *A. monuste*.

Fig. 54. Honey bee and bumble bee collecting pollen on yellow alder (*Turnera ulmifolia* "El Dorado," Family Passifloraceae). Native to Caribbean isles and tropical Mexico, plants are cold sensitive, and flowers last but one day, closing in afternoon heat. Can serve as host for Variegated Fritillary Butterfly. Photo: Allen D. Owings.

Fig. 55. Bumble bee visiting a tropical hibiscus flower (*Hibiscus paramutabilis*) "Light Pink," Family Malvaceae. Most related plants — including commercial cotton (*Gossypium*) — serve as hosts for the small, attractive Gray Hairstreak.

Honey bees and bumble bees were even more numerous than butterflies—predictable, of course. (An assortment of small native bees, flies, true bugs, and miscellaneous insects that contribute directly or indirectly to the pollination of flowers were present, too.) In some flower beds, honey bees were so numerous that a distinct hum was audible. Virtually all flowers were being sampled—principally for nectar rather than pollen. Porterweed (*Stachtarpheta*) and several salvias seemed to be especially favored. Even species such as Mexican cigar (*Cuphea*), Turks cap (*Malvaviscus*), and firebush (*Hamelia*)—all of which have tight, tubular corollas adapted principally for the long bills of hummingbirds—were not overlooked; the bees simply used their mandibles to cut into the base of the flower to collect the nectar.

Linda Beall (a professional/registered hummingbird bander) and assistants, Donata Henry and Alma Chasez, reported catching and banding 20 Ruby-throated Hummingbirds (13 immature males, 4 adult and 3 immature females). According to Linda, "We did not capture any adult males, which reflects and confirms that the adult males migrate southward before females and immature birds." Continuing, "I was disappointed in number, but believe the low capture rate was due to several reasons: (1) the grounds were well planted with nectar-producing flowers so that the birds were not desperate to feed at the artificial feeders we posted; (2) timing was a little past the peak for hummingbird seasonal migration; (3) a recent frontal passage from the north probably spurred some of the birds onward." Nonetheless, according to one festival visitor the activity presented a "unique opportunity to experience experts who were enthusiastic to share their passion for hummingbirds and nature."

Fig. 56. Vendor of pollinator-friendly plants.

Fig. 57. Greenhouses for propagating and protecting new plants. Turk's cap, in foreground, is a perennial favorite hummingbird and bee plant. Cloudless Sulphur butterflies often visit the bright red flowers, too. (INSET: Test plot for *Celosia argentea* "Intenz Classic," Family Amaranthaceae. Some amaranths are renowned for their protein-rich seeds, used as cereal grains. The new cultivar is one of the "Louisiana Super Plants"; sterile but still attractive to bees.)

Fig. 58. Volunteer school girl entrepreneurs vending homemade lemonade. Profits were donated to a local charity.

Fig. 59. Trial bed of dwarf pentas (star clusters) — warm-season annuals especially attractive to most butterflies and bees. Cultivars developed in several colors and heights. Pentas, along with firebush, serve as hosts for the Tersa Sphinx moth.

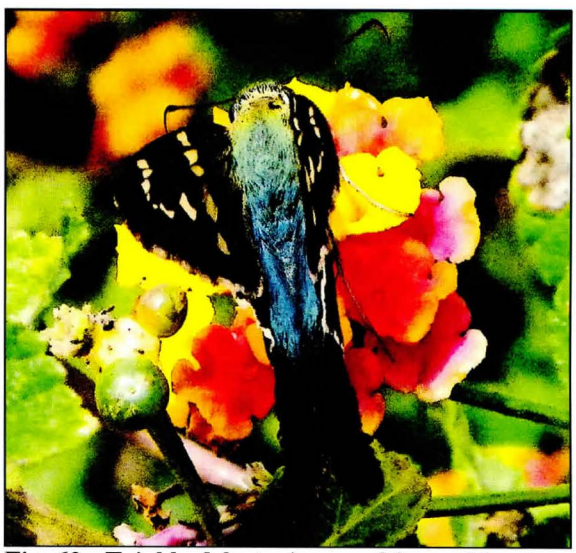

Fig. 60. Trial bed featuring a cultivar of *Lantana camara,* Family Verbenacea), an alpha butterfly-attracting plant in the Gulf South. A Long-tailed Skipper butterfly (*Urbanus proteus*) is pictured. Species was abundant. Host plants are legumes (Family Fabaceae), including false indigo, wisteria, hyacinth bean and other bean-related vines, and locust trees.

Fig. 61. Vendor of garden-appropriate handicrafts.

In the end, attendance was tagged at roughly 1,000. I had expected a higher number because of the extensive advertising. But when I consider the 90-degree heat, the recent flood disaster, and a university football game that evening in Hammond, I am content. TPMGA did not make a profit with this initial event. Members, however, were encouraged by the positive feedback of visitors and educational value provided to the public. (TPMGA supports funding as well as hands-on- education for local students interested in plant-based projects and schooling.) With the success of its first major undertaking, TPMGA has scheduled Saturday 16, 2017, for its "Second Annual Pollination Celebration." Dr. Allen D. Owings, Professor and Research Coordinator, LSU AgCenter, Hammond Research Station, was pleased, too: "I think the festival brought in the highest number of visitors to the station to date."

[NOTE: All photographs by the author unless stated otherwise.]

ACKNOWLEDGEMENTS

I would like to especially thank the following individuals for their most generous time and assistance: Members of the Tangipahoa Parish Master Gardener Association—especially, Sheryl Chipley Till (Albany) and Carolyn De Rouen (Denham Springs); personnel of the LSU AgCenter, Hammond Research Station—especially Dr. Allen D. Owings, Dr. Yan Chen, and Karen Brewer; and Linda Beall (Covington).

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Fig. 62. Historic house and reconstructed period garden from a late nineteenth-century homestead. (INSET: Plaque identifing Fig. 62.) Crape myrtle tree (right) is variety "Natchez White," popular because of its white blooms and variegated trunks.

(Gary N. Ross, E-Mail: GNRoss40@yahoo.com)

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SLS 2016 BUSINESS MEETING MINUTES

Chairman John Douglass called the meeting to order at 5:06pm on Saturday, October 29, 2016, at the McGuire Center conference room, Florida Museum of Natural History, in Gainesville, Florida.

The following members signed the attendance sheet:

James Adams	Leroy Koehn
Eric Anderson	Debbie Matthews
Terry Arbogast.	Jackie Miller
David Auth	Marc Minno
Robert Beiriger	Steve Mix
Matt Cousins	Jim Monroe
Charlie Covell	Thomas Neal
John Douglass	Emily Peyton
Lance Durden	Bill Russell
Rick Gillmore	Brian Scholtens
John Hyatt	Jeff Slotten

John Douglass summarized 2015 minutes. Motion to accept was APPROVED.

TREASURER'S REPORT:
Jeff Slotten presented the report highlighting the SLS financials. After a lively discussion, Charlie Covell's motion to increase dues by $5 across categories (except student) beginning in 2017 was APPROVED. A motion to create a Publication fund accepting any amount contributed to help offset cost of the newsletters was APPROVED.

LIFE MEMBERSHIP:
John Douglass led this discussion using opinions supplied by LEPSOC and other individuals. The current three Life Members will discuss and perhaps request monies they donated might be better directed to a fund for newsletter publication.

NEWSLETTER:
All members applauded the newsletter and our editor and his and other members contributions to keep it thriving. James Adams, Leroy Koehn, and others gave opinions and suggestions for lowering costs (font size, page limits, electronic option, etc.) to be considered.

John offered special thanks to Debbie and Terry Matthews for scanning the 30+ years of SLS Newsletters.

JOHN ABBOT AWARD:
Debbie Matthews and Harry Pavulaan are the candidates for the 2017 award. James Adams will become involved in this work.

CONSTITUTION:
Two proposals previously printed for our members involving Board members to be elected and to be appointed, as well as new duties for the Membership Coordinator were discussed and APPROVED without change. Rick Gillmore also proposed a word change that was APPROVED.

MEETINGS AND ANNOUNCEMENTS:
2017 SLS Business meeting will be in Gainesville. Future meetings in other locations from time to time will be considered, although attendance is a concern. Special thanks was enthusiastically demonstrated by those present for the work of Jackie, Debbie, and others who make this meeting so comfortable, professional, and enjoyable for the presenters and especially the members in attendance.

Meeting adjourned for banquet at 5:40pm.

Respectfully submitted by Steve Mix, Secretary Pro Tem

The Butterflies of North Carolina: A Photographic Gallery
Part 1 – True Butterflies

by

Parker Backstrom

From heath balds, fens, and spruce-fir forests in the mountains, to hardwood bottomlands and riverine swamp forests in the Piedmont, to scrub-oak woodlands and canebrakes in the Sandhills, to longleaf pine-savannas, peatland pocosins, salt marshes, and beach dunes in the Coastal Plain, North Carolina offers up a vast array of habitats rich in flora and fauna (Schafale, 2012). More than 2,700 species of moths (Hall, et al., 2016), 463 species of birds (LeGrand, Haire, Swick, and Howard, 2016), 187 species of Odonates (LeGrand, Corey, and Howard, 2016), 164-169 species of reptiles and amphibians (Jeff Beane, pers. comm.), 121 species of mammals (LeGrand and Howard, 2016b), and roughly 3,550 species of vascular plants (Harry LeGrand, pers. comm.), are known from the state. Added to this, 177 species of butterflies have been recognized as occurring or having occurred (LeGrand and Howard, 2016a). Of the state's 177 species of butterflies, 104 are classified as "true butterflies" and 73 classified as skippers. Thirty-seven species are tracked by the North Carolina Natural Heritage Program for conservation purposes, and two taxa—'St. Francis's' Satyr (*Neonympha mitchelli francisci*) and Crystal Skipper (*Atrytonopsis quinteri*)—are endemic to North Carolina (LeGrand, Ratcliffe, and Finnegan, 2014).

This gallery features images of North Carolina's true butterflies, all taken in the wild, and all taken in the state. In total, 96 of the 104 species have been documented by photographs. While my aim was to present photos of all 96 species, images that do exist of several rare species are not included, though they can be found elsewhere: Those of Cassius Blue (*Leptotes cassius*) can be seen on *Butterflies of North Carolina: 23rd Approximation* (LeGrand and Howard, 2016a), and those of Gorgone Checkerspot (*Chlosyne gorgone*) are featured in *Butterflies of the East Coast: An Observer's Guide* (Cech and Tudor, 2005). Live photographs of a third species, 'Seminole' Texan Crescent (*Anthanassa texana seminole*), could not be located and are unpublished. Also missing from this gallery are eight species that were placed on the state's official list based upon specimens or sight records only. They are Southern Dogface (*Zerene cesonia*), Large Orange Sulphur (*Phoebis agarithe*), Orange-barred Sulphur (*Phoebis philea*), Barred Yellow (*Eurema daira*), Ceraunus Blue (*Hemiargus ceraunus*), Regal Fritillary (*Speyeria idalia*), Milbert's Tortoiseshell (*Aglais milberti*), and Goatweed Leafwing (*Anaea andria*).

The scientific nomenclature used follows Warren, et al. (2016).

Fig. 1. Pipevine Swallowtail (*Battus philenor*)
2007-Jul-07 – Wilkes Co NC, Doughton Park

Fig. 2. Zebra Swallowtail (*Eurytides marcellus*)
2004-Jun-19 – Washington Co NC

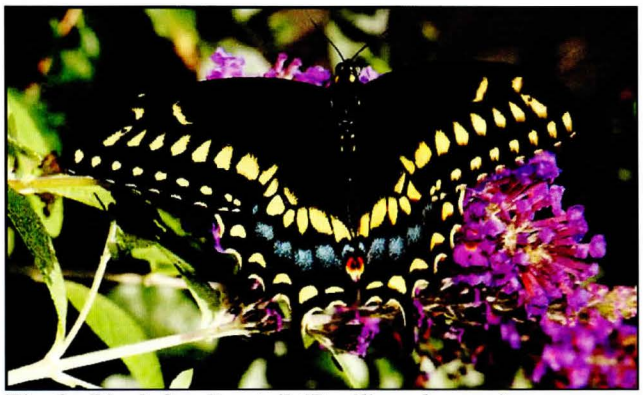

Fig. 3. Black Swallowtail (*Papilio polyxenes*)
2012-Aug-26 – Chatham Co NC

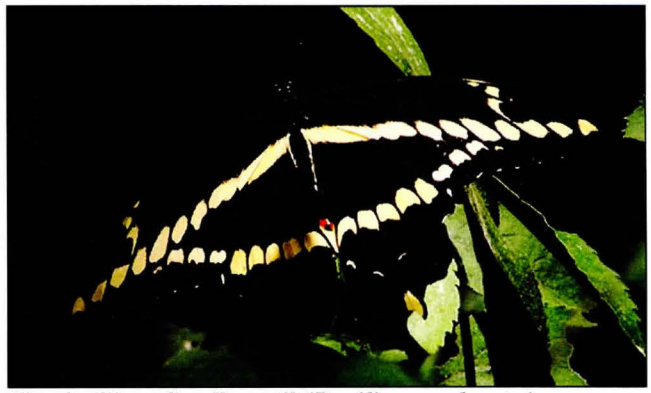

Fig. 4. Giant Swallowtail (*Papilio cresphontes*)
2008-Aug-24 – Ashe Co NC

Fig. 5. Eastern Tiger Swallowtail (*Papilio glaucus*)
2006-Apr-01 – Chatham Co NC

Fig. 6. Appalachian Tiger Swallowtail (*Papilio appalachiensis*) 2007-May-26 – Clay Co NC

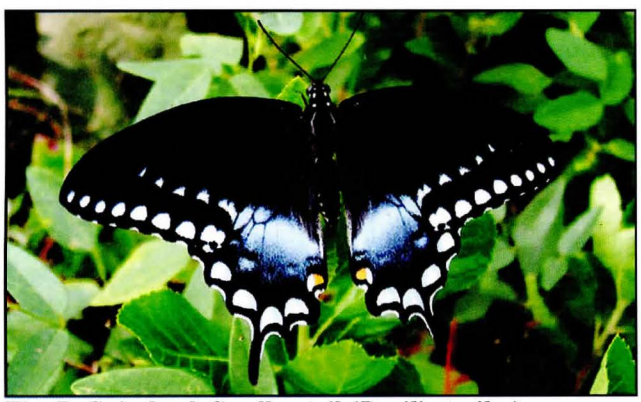

Fig. 7. Spicebush Swallowtail (*Papilio troilus*)
2004-Jul-21 – Moore Co NC

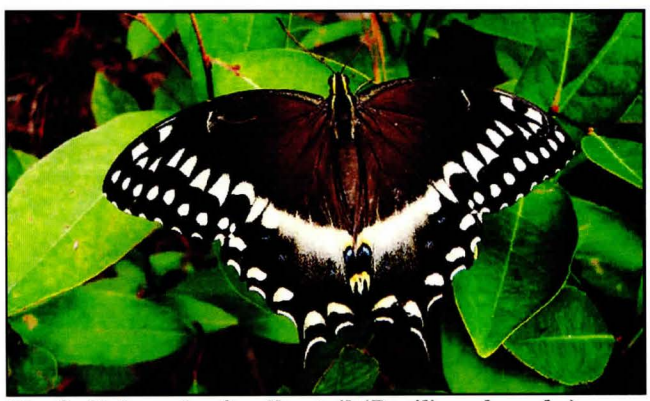

Fig. 8. Palamedes Swallowtail (*Papilio palamedes*)
2004-Jul-25 – Moore Co NC

Fig. 9. Checkered White (*Pontia protodice*)
2010-Sep-21 – Chatham Co NC

Fig. 10. West Virginia White (*Pieris virginiensis*)
2005-May-14 – Clay Co NC

Fig. 11. Cabbage White (*Pieris rapae*)
2006-Jul-16 – Chatham Co NC

Fig. 12. Great Southern White (*Ascia monuste*)
2002-Aug-20 – Carteret Co NC

Fig. 13. Olympia Marble (*Euchloe olympia*)
2012-Apr-09 – Madison Co NC

Fig. 14. Falcate Orangetip (*Anthocharis midea*)
2005-Mar-30 – Durham Co NC

Fig. 15. Clouded Sulphur (*Colias philodice*)
2005-Sep-24 – Ashe Co NC

Fig. 16. Orange Sulphur (*Colias eurytheme*)
2006-Apr-01 – Chatham Co NC

Fig. 17. Cloudless Sulphur (*Phoebis sennae*)
2006-Aug-26 – New Hanover Co NC

Fig. 18. Little Yellow (*Pyrisitia lisa*)
2004-Oct-14 – Richmond Co NC

Fig. 19. Sleepy Orange (*Abaeis nicippe*)
2010-Sep-17 – Chatham Co NC

Fig. 20. Dainty Sulphur (*Nathalis iole*)
2002-Oct-16 – Mecklenburg Co NC, McDowell NP

Fig. 21. Harvester (*Feniseca tarquinius*)
2006-Apr-15 – Granville Co NC, Camp Butner

Fig. 22. American Copper (*Lycaena phlaeas*)
2006-Jul-16 – Allegheny Co NC, Doughton Park

Fig. 23. Great Purple Hairstreak (*Atlides halesus*)
2006-Sep-16 – Hyde Co NC

Fig. 24. Coral Hairstreak (*Satyrium titus*)
2005-Jun-11 – Moore Co NC, Weymouth Woods

Fig. 25. Edwards' Hairstreak (*Satyrium edwardsii*)
2006-Jun-13 – Moore Co NC, Weymouth Woods

Fig. 26. Banded Hairstreak (*Satyrium calanus*)
2006-Jun-04 – Moore Co NC, Weymouth Woods

Fig. 27. Hickory Hairstreak (*Satyrium caryaevorus*)
2002-Jul-07 – Buncombe Co NC

Fig. 28. King's Hairstreak (*Satyrium kingi*)
2006-Jun-13 – Moore Co NC, Weymouth Woods

Fig. 29. Striped Hairstreak (*Satyrium liparops*)
2006-Jul-03 – Ashe Co NC

Fig. 30. 'Southern' Oak Hairstreak (*Satyrium favonius*)
2008-May-18 – New Hanover Co

Fig. 31. Brown Elfin (*Callophrys augustinus*)
2005-Mar-25 – Moore Co NC, Weymouth Woods

Fig. 32. Frosted Elfin (*Callophrys irus*)
2005-Apr-28 – Moore Co NC

Fig. 33. Henry's Elfin (*Callophrys henrici*)
2005-Apr-01 – Hoke Co NC

Fig. 34. Eastern Pine Elfin (*Callophrys niphon*)
2005-Apr-04 – Harnett Co NC, Raven Rock SP

Fig. 35. Juniper Hairstreak (*Callophrys gryneus*)
2011-Jul-19 – Chatham Co NC

Fig. 36. Hessel's Hairstreak (*Callophrys hesseli*)
2007-Mar-25 – Bladen Co NC

Fig. 37. White-M Hairstreak (*Parrhasius m-album*)
2004-Jul-21 – Moore Co NC, Weymouth Woods

Fig. 38. Gray Hairstreak (*Strymon melinus*)
2005-Jul-27 – Moore Co NC, Weymouth Woods

Fig. 39. Red-banded Hairstreak (*Calycopis cecrops*)
2008-Aug-22 – Chatham Co NC

Fig. 40. Early Hairstreak (*Erora laeta*)
2016-Apr-18 – Ashe Co NC

Fig. 41. Eastern Tailed-Blue (*Cupido comyntas*)
2004-Jun-27 – Chatham Co NC

Fig. 42. Spring Azure (*Celastrina ladon*)
2005-Mar-30 – Wake Co NC

Fig. 43. Holly Azure (*Celastrina idella*)
2007-Mar-23 – Bladen Co NC

Fig. 44. Summer Azure (*Celestrina neglecta*)
2005-Jul-02 – Stanly Co NC

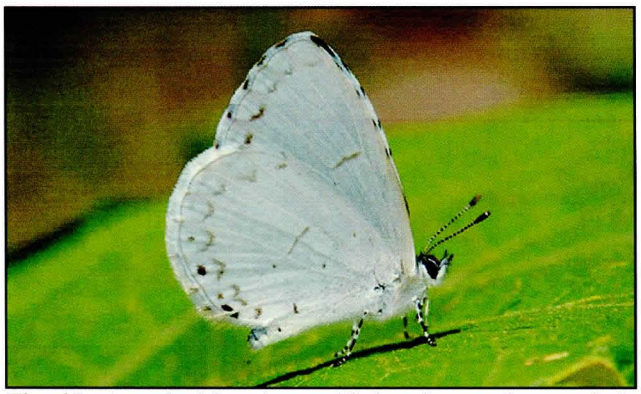

Fig. 45. Appalachian Azure (*Celastrina neglectamajor*)
2007-May-27 – Clay Co NC

Fig. 46. Dusky Azure (*Celastrina nigra*)
2006-Apr-28 – Graham Co NC

Fig. 47. Silvery Blue (*Glaucopsyche lygdamus*)
2005-May-14 – Clay Co NC

Fig. 48. Little Metalmark (*Calephelis virginiensis*)
2005-Aug-28 – Carteret Co NC

Fig. 49. American Snout (*Libytheana carinenta*)
2004-Aug-17 – Johnston Co NC

Fig. 50. Gulf Fritillary (*Agraulis vanilla*)
2004-Oct-12 – Moore Co NC

Fig. 51. Zebra Longwing (*Heliconius charithonia*)
2008-Jul-13 – Carteret Co NC, Fort Macon SP

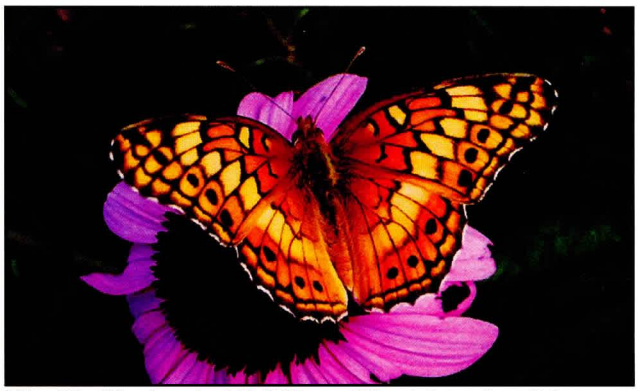

Fig. 52. Variegated Fritillary (*Euptoieta claudia*)
2004-Jul-12 – Chatham Co NC

Fig. 53. Diana Fritillary (*Speyeria diana*)
2005-Jul-15 – Avery Co NC

Fig. 54. Great Spangled Fritillary (*Speyeria cybele*)
2005-Jul-15 – Ashe Co NC

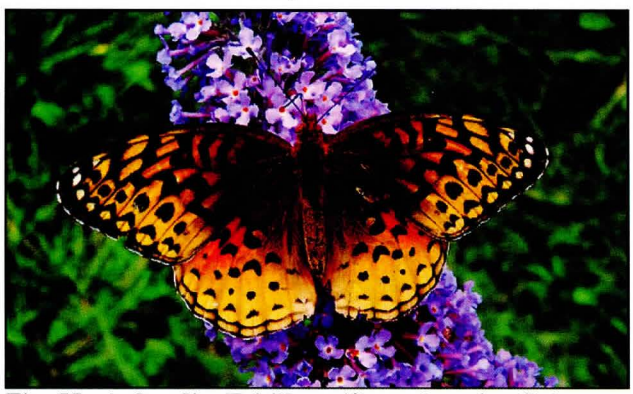

Fig. 55. Aphrodite Fritillary (*Speyeria aphrodite*)
2004-Jul-31 – Watauga Co NC

Fig. 56. Meadow Fritillary (*Boloria bellona*)
2006-Jun-12 – Ashe Co NC

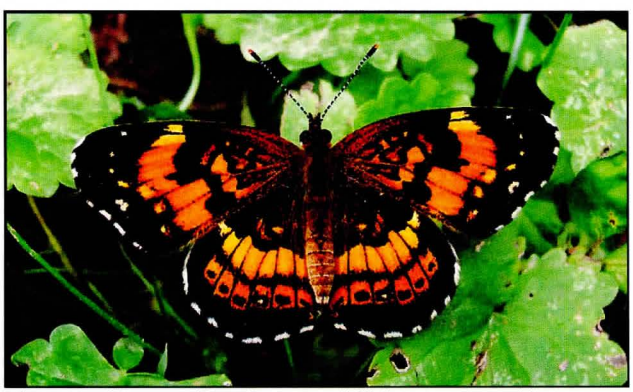

Fig. 57. Silvery Checkerspot (*Chlosyne nycteis*)
2004-Jun-29 – Orange Co NC

Fig. 58. Phaon Crescent (*Phyciodes phaon*)
2007-Apr-14 – New Hanover Co NC, Fort Fisher SP

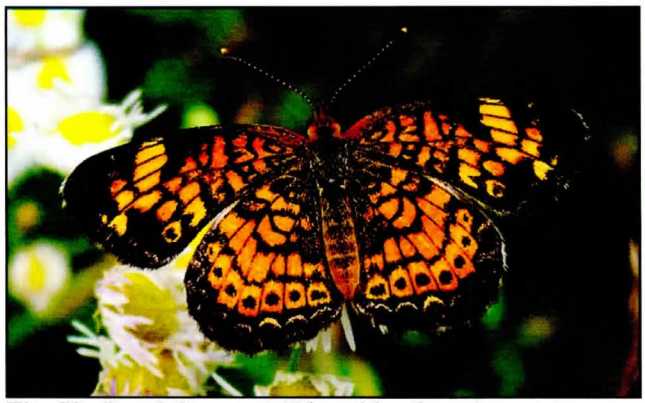

Fig. 59. Pearl Crescent (*Phycoides tharos*)
2004-Jun-14 – Chatham Co NC

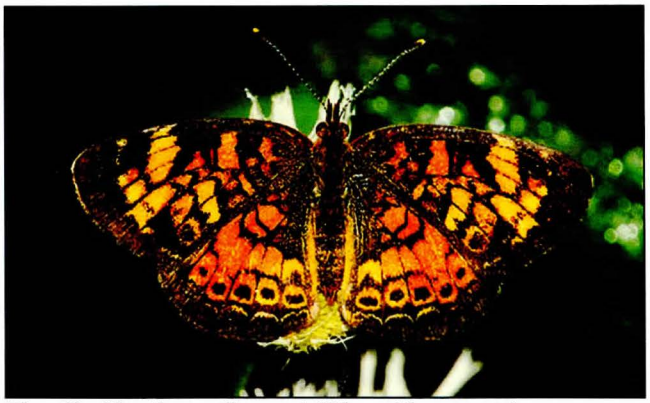

Fig. 60. Northern Cresent (*Phycoides cocyta*)
2011-May-28 – Graham co NC

Fig. 61. Tawny Crescent (*Phyciodes batesii maconensis*) 2011-May-28 – Graham Co NC

Fig. 62. Baltimore Checkerspot (*Euphydryas phaeton*)
2011-May-28 – Graham Co NC

Fig. 63. Question Mark (*Polygonia interrogationis*)
2004-Jun-29 – Orange Co NC

Fig. 64. Eastern Comma (*Polygonia comma*)
2004-Aug-17 – Johnston Co NC

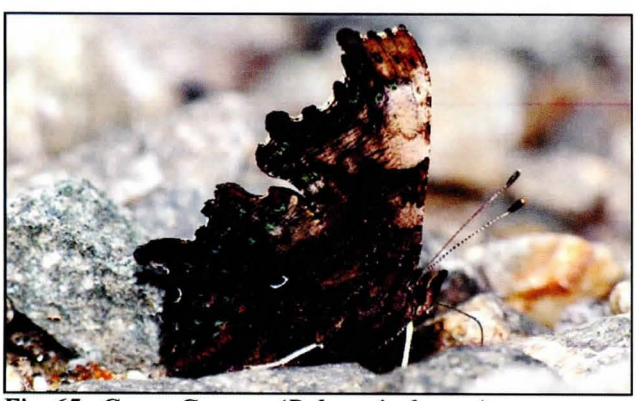

Fig. 65. Green Comma (*Polygonia faunus*)
2009-Aug-08 – Yancey Co NC

Fig. 66. Gray Comma (*Polygonia progne*)
2008-Sep-13 – Watauga Co NC

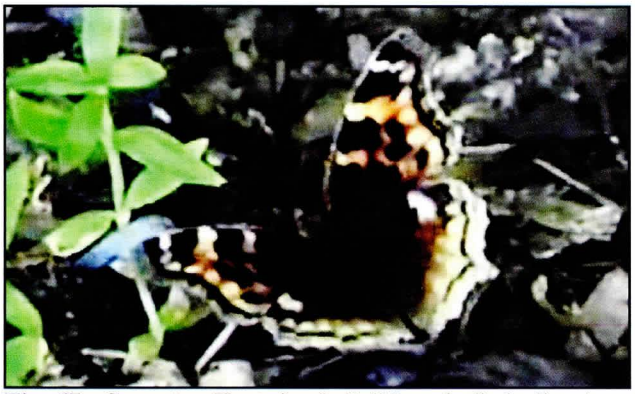

Fig. 67. Compton Tortoiseshell (*Nymphalis l-album*)
1995-Aug-15 – Dare Co NC, Southern Shores

Fig. 68. Mourning Cloak (*Nymphalis antiopa*)
2009-May-28 – Chatham Co NC

Fig. 69. American Lady (*Vanessa virginiensis*)
2004-Jun-15 – Wake Co NC

Fig. 70. Painted Lady (*Vanessa cardui*)
2004-Oct-09 – Chatham Co NC

Fig. 71. Red Admiral (*Vanessa atalanta*)
2007-Jul-07 – Wilkes Co NC

Fig. 72. Mimic (*Hypolimnas misippus*)
2013-Oct-13 – Carteret Co NC, Manteo

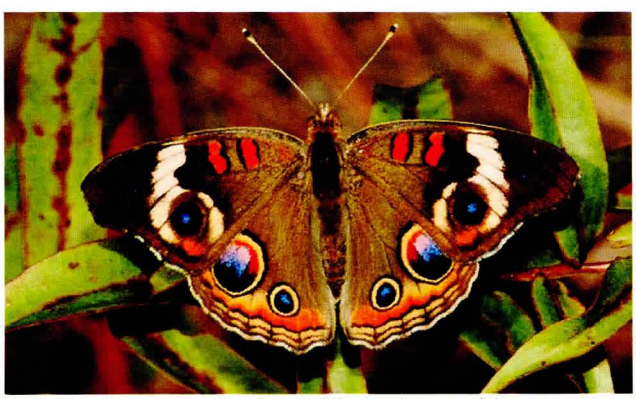

Fig. 73. Common Buckeye (*Junonia coenia*)
2007-Aug-25 – Moore Co NC

Fig. 74. White Peacock (*Anartia jatrophae*)
2006-Oct-21 – Hyde Co NC, Lake Mattamuskeet

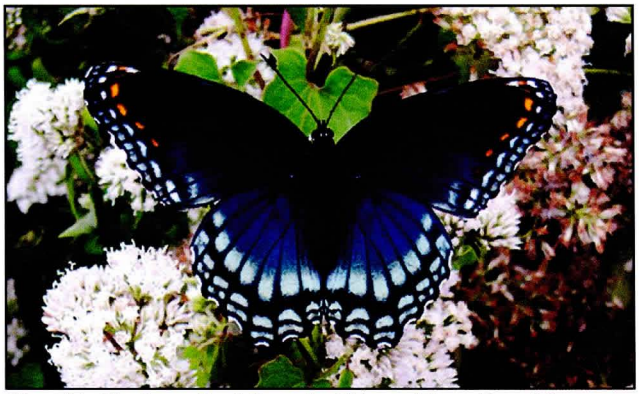

Fig. 75. Red-spotted Purple (*Limenitis arthemis*)
2006-Sep-16 – Hyde Co NC

Fig. 76. Viceroy (*Limentis archippus*)
2004-Jun-27 – Chatham Co NC

Fig. 77. Hackberry Emperor (*Asterocampa celtis*)
2004-Aug-26 – Harnett Co NC

Fig. 78. Tawny Emperor (*Asterocampa clyton*)
2007-Aug-17 – Wilkes Co NC

Fig. 79. Southern Pearly-eye (*Lethe portlandia*)
2005-Jul-31 – Moore Co NC

Fig. 80. Northern Pearly-eye (*Lethe anthedon*)
2011-May-28 – Graham Co NC

Fig. 81. Creole Pearly-eye (*Lethe creola*)
2004-Aug-16 – Harnett Co NC

Fig. 82. Appalachian Brown (*Lethe appalachia*)
2007-Jun-01 – Alleghany Co NC

Fig. 83. Gemmed Satyr (*Cyllopsis gemma*)
2005-Apr-05 – Harnett Co NC

Fig. 84. Carolina Satyr (*Hermeuptychia sosybius*)
2004-Jun-13 – Chatham Co NC

Fig. 85. Intricate Satyr (*Hermeuptychia intricata*)
2016-Aug-12 – Jones Co NC

Fig. 86. Georgia Satyr (*Neonympha areolatus*)
2008-Aug-16 – Craven Co NC

Fig. 87. Helicta Satyr (*Neonympha helicta*)
2005-Jun-04 – Harnett Co NC

Fig. 88. Mitchell's Satyr (*Neonympha mitchellii*)
2006-Jun-04 – Cumberland Co NC

Fig. 89. Little Wood-Satyr (*Megisto cymela*)
2009-May-23 – Chatham Co NC

Fig. 90. Common Wood-Satyr (*Cercyonis pegala*)
2006-Jul-16 – Allegheny Co NC, Doughton Park

Fig. 91. Monarch (*Danaus plexippus*)
2004-Oct-14 – Richmond Co NC

Fig. 92. Queen (*Danaus gilippus*)
2009-Aug-28 – New Hanover Co NC, Fort Fisher SP

Fig. 93. Soldier (*Danaus eresimus*)
2007-Jul-27 – Carteret Co NC, Fort Macon SP

Annotated List of the True Butterflies of North Carolina

The information below is summarized from LeGrand and Howard (2016a). Their comprehensive treatment of all of North Carolina's butterflies—which is available only in electronic form—is a tremendous resource for those interested in butterflies of the Carolinas.

Pipevine Swallowtail (*Battus philenor*) – Fig. 1. Found statewide, being most common in the Mountain Province and decreasing in abundance eastward to the Coastal Plain, where it is rare. Flies early spring to mid-fall.

Zebra Swallowtail (*Eurytides marcellus*) – Fig. 2. Found statewide but generally local in occurrence, abundance decreasing from the Coastal Plain into the mountains. Mostly early spring flier, numbers decreasing through summer into early fall.

Black Swallowtail (*Papilio polyxenes*) – Fig. 3. Found statewide but generally more common along the coast, though nowhere numerous. Flies early spring into mid-fall.

Giant Swallowtail (*Papilio cresphontes*) – Fig. 4. Largely coastal, where it is an uncommon migrant. Though very rarely observed in the Piedmont, sporadic sightings in the mountains and foothills suggest small resident populations in these areas. Flies spring into mid-fall, with the bulk of records from late summer.

Eastern Tiger Swallowtail (*Papilio glaucus*) – Fig. 5. Generally common and widespread across the state. Flies early spring into mid-fall.

Appalachian Tiger Swallowtail (*Papilio appalachiensis*) – Fig. 6. A single-brooded, early spring into mid-summer flier. Restricted to the mountains, where it can be locally common in the southern half, uncommon in the northern half.

Spicebush Swallowtail (*Papilio troilus*) – Fig. 7. Generally widespread across the state, though not as abundant as *P. glaucus*. Flies early spring into early fall.

Palamedes Swallowtail (*Papilio palamedes*) – Fig. 8. Restricted almost entirely to the Coastal Plain, where it can be seen in large numbers, particularly in the southern half. Flies early spring into mid-fall.

Checkered White (*Pontia protodice*) – Fig. 9. Scattered records from across the state. It was at one time locally common in the Piedmont, but is generally rare anywhere now—especially on Coastal Plain—and declining. Small flight begins early spring with numbers building into mid-fall.

West Virginia White (*Pieris virginiensis*) – Fig. 10. A single-brooded, early spring flier that is restricted to the mountains, where it can be uncommon to locally common.

Cabbage White (*Pieris rapae*) – Fig. 11. Fairly common across the state, though it becomes generally uncommon in the Coastal Plain, especially along the coast. Flies much of the year, from late winter to late fall. As is the case with *Pontia protodice*, this species has shown a decline in the past decade.

Great Southern White (*Ascia monuste*) – Fig. 12. A handful of records of this southern migrant from the Piedmont and Coastal Plain, primarily in late summer. Most are sight records, though the species has been once photographed.

Olympia Marble (*Euchloe olympia*) – Fig. 13. A very rare and local breeder, known only from a couple of small populations in the mountains. A single-brooded, very early spring flier.

Falcate Orangetip (*Anthocharis midea*) – Fig. 14. Widespread across the state, it is most common in the Piedmont and Coastal Plain and is absent at highest mountain elevations. A single-brooded, early spring flier, it can be locally common in suitable habitat.

Clouded Sulphur (*Colias philodice*) – Fig. 15. Occurs across the state but is most common in the Piedmont and mountains. Numbers appear to be on the decline, though the challenge of separating *C. philodice* from *C. eurytheme* creates uncertainty about actual status. Long flight period, from late winter into late fall.

Orange Sulphur (*Colias eurytheme*) – Fig. 16. Widespread across the state and much more common than the previous species, although like several other Pierids, it appears to be on the decline. Flies from early spring to late fall.

Southern Dogface (*Zerene cesonia*) – Unfigured. A very rare migrant from the south, with scattered records from the Piedmont and Coastal Plain from spring through fall.

Cloudless Sulphur (*Phoebis sennae*) – Fig. 17. Widespread across the state, though most common in the Piedmont and Coastal Plain. Notable for its large movements northward along the coast in the fall.

Large Orange Sulphur (*Phoebis agarithe*) – Unfigured. An accidental stray from the south, represented in the state by one sight record from the Piedmont in early spring, and one from the northeast coast in fall.

Orange-barred Sulphur (*Phoebis philea*) – Unfigured. Accidental. Known from two fall records, one recent from the southeast coast, one historical from the mountains.

Barred Yellow (*Eurema daira*) – Unfigured. Once considered casual in the state, it is now strictly accidental, with just one record (specimen) in recent decades. All records from mid- to late summer.

Little Yellow (*Pyrisitia lisa*) – Fig. 18. Widespread across the state, it is considered largely a migrant, primarily in the fall. Generally common in the eastern half of the state, uncommon to rare in the western half.

Sleepy Orange (*Abaeis nicippe*) – Fig. 19. Widespread but most common in the Coastal Plain and Piedmont. Early spring to late fall flier, but on the wing somewhere all year. Especially conspicuous during the fall months.

Dainty Sulphur (*Nathalis iole*) – Fig. 20. A casual, mostly fall visitor with scattered records across the Piedmont and mountains. A major "outbreak" in 2012, numbering in the hundreds, skews abundance data (See LeGrand and Howard, 2016a).

Harvester (*Feniseca tarquinius*) – Fig. 21. Widespread but local and typically hard to find. Multi-brooded and on the wing into mid-fall, though most often encountered during the spring months. Abundance decreases from the mountains and Piedmont, where uncommon, to the Coastal Plain, where very rare.

American Copper (*Lycaena phlaeas*) – Fig. 22 (Aberrant individual). Largely restricted to the mountains, where local and uncommon, though there are scattered records from the Piedmont and Sandhills. May be in decline, even in its historical strongholds.

Great Purple Hairstreak (*Atlides halesus*) – Fig. 23. Locally uncommon in much of the Coastal Plain—though common in places—becoming rare to very rare in the Piedmont and mountains. Flies early spring into late fall.

Coral Hairstreak (*Satyrium titus*) – Fig. 24. Widespread but largely uncommon in the Piedmont, rare in Coastal Plain counties bordering the Piedmont, and absent in the balance of the mountains and Coastal Plain. Single-brood flies mid-spring into mid-summer.

Edwards' Hairstreak (*Satyrium edwardsii*) – Fig. 25. Restricted primarily to the Sandhills, where it can be locally uncommon to common during June flight period. A handful of records from the mountains, mostly historical.

Banded Hairstreak (*Satyrium calanus*) – Fig. 26. Widespread but uncommon in the mountains and Piedmont, rare and scattered across the Coastal Plain. Flies mid-spring through mid-summer.

Hickory Hairstreak (*Satyrium caryaevorus*) – Fig. 27. Poorly known. Currently considered very rare in the mountains during summer flight period, though its similarity to *S. calanus* likely masks a true understanding of its status.

King's Hairstreak (*Satyrium kingi*) – Fig. 28. Uncommon and highly localized across the Sandhills and southern and eastern Coastal Plain. A handful of records from the Piedmont and mountains. One flight, mid-spring into mid-summer.

Striped Hairstreak (*Satyrium liparops*) – Fig. 29. Scattered and unevenly distributed across the three provinces. Generally considered rare, or at the least hard to find during mid-spring to mid-summer flight period.

Oak Hairstreak (*Satyrium favonius*) – Fig. 30. 'Southern' form (*S. f. favonius*) uncommon to locally common in maritime forests in the southeastern Coastal Plain. Records of the 'Northern' form (*S. f. ontario*) have come from widely scattered locations—mostly in the Piedmont—though it is rare everywhere. One flight, mid-spring to early summer.

Brown Elfin (*Callophrys augustinus*) – Fig. 31. Aside from the Sandhills and a few scattered locations in the northern Piedmont, found primarily in the mountains and foothills. Very early spring flier.

Frosted Elfin (*Callophrys irus*) – Fig. 32. Enigmatic and rare to very rare, mostly in the Sandhills and southeastern coastal counties. Virtually absent west of the Coastal Plain fall-line. Flies early spring.

Henry's Elfin (*Callophrys henrici*) – Fig. 33. Widespread and uncommon to fairly common in the eastern half of the state, though never found in any numbers. Uncommon to rare in the western Piedmont, and very rare in the southern mountains. Early spring flier.

Eastern Pine Elfin (*Callophrys niphon*) – Fig. 34. Widely scattered across the state. Uncommon to rare across Piedmont and the southern Coastal Plain, and rare in the northern half of the Coastal Plain. Very rare in the mountains. Early to late spring flier.

Juniper Hairstreak (*Callophrys gryneus*) – Fig. 35. Uncommon to locally common across the Piedmont. Absent across most of the Coastal Plain, though locally uncommon along the immediate coast. Very rare in the mountains. Two broods, early spring to late summer.

Hessel's Hairstreak (*Callophrys hesseli*) – Fig. 36. Rare to uncommon and very local in scattered sites in the Sandhills and southern Coastal Plain, with scattered records in the northern Coastal Plain. No records from the Piedmont or mountain provinces. Like previous species, two-brooded with flights in early spring and late summer.

White-M Hairstreak (*Parrhasius m-album*) – Fig. 37. Widely scattered across the state but uncommon to rare everywhere. Multi-brooded, flies early spring to mid-fall.

Gray Hairstreak (*Strymon melinus*) – Fig. 38. Widespread and common across the state and frequently encountered, particularly across the Piedmont and Coastal Plain. Flies early spring into fall.

Red-banded Hairstreak (*Calycopis cecrops*) – Fig. 39. Widespread across the state. Generally common in portions of the Piedmont, uncommon in the mountains. Can be locally abundant in the lower Coastal Plain. On the wing early spring into mid-fall.

Early Hairstreak (*Erora laeta*) – Fig. 40. Rare resident of the mountains, or at the very least rarely encountered, though sightings have increased in recent years. Two flight periods, early to mid-spring, and mid- to late summer.

Cassius Blue (*Leptotes cassius*) – Unfigured (See comments in introduction). Accidental. Three individuals seen in three different years by a single observer in his yard in the southeastern Coastal Plain, though no records since 2010. All records from late summer.

Ceraunus Blue (*Hemiargus ceraunus*) – Unfigured. Three records, all from Piedmont and Coastal Plain counties bordering South Carolina, the most recent from 2005. The two known dates are from the first half of August.

Eastern Tailed-Blue (*Cupido comyntas*) – Fig. 41. Widespread and very common to abundant across the state. Flies early spring to mid-fall.

Spring Azure (*Celastrina ladon*) – Fig. 42. Common to uncommon in the mountains and Piedmont, and while uncommon to rare in the southern Coastal Plain, seemingly absent in the northern half of that province. Thought to be declining. Single, spring flight concludes the first week of June. See LeGrand and Howard (2016a) for discussion of the "Spring Azure complex."

Holly Azure (*Celastrina idella*) – Fig. 43. Virtually limited to the Coastal Plain, where it is common to locally abundant. One early spring flight.

Summer Azure (*Celastrina neglecta*) – Fig. 44. Widespread across the state. Abundant in the mountains, becoming common across Piedmont to the Coastal Plain. Multi-brooded with flights early spring to mid-fall. Spring flight overlaps that of *C. ladon*. *C. neglecta* is the only azure that is flying downstate after May (LeGrand and Howard, 2016a).

Appalachian Azure (*Celastrina neglectamajor*) – Fig. 45. Limited almost entirely to the Mountain Province, though there are scattered records from the foothills. Generally uncommon over most of the mountains, it is locally common in a few areas. Flies early spring to mid-summer. Flight dates overlap those of *C. ladon* and *C. neglecta* (See LeGrand and Howard, 2016a).

Dusky Azure (*Celastrina nigra*) – Fig. 46. Found almost entirely in the southern mountains, where it is considered locally uncommon to rare. One flight, early to mid-spring.

Silvery Blue (*Glaucopsyche lygdamus*) – Fig. 47. Limited almost entirely to the southern half of the mountains, where it is rare to locally numerous in early spring.

Little Metalmark (*Calephelis virginiensis*) – Fig. 48. Uncommon to locally common in pine-savanna habitat, primarily along the coast in the southern half of the Coastal Plain. Multi-brooded, flying early spring to mid-fall.

American Snout (*Libytheana carinenta*) – Fig. 49. Occurs statewide and on the wing throughout much of the year. Generally uncommon in the Coastal Plain and Piedmont, though locally common in places. Uncommon to rare in the mountains.

Gulf Fritillary (*Agraulis vanilla*) – Fig. 50. A largely late summer through late fall migrant from the south. Although it occurs statewide, it is regular but uncommon west of the Coastal Plain. At times common in the southern Coastal Plain, where it is considered at least partially resident.

Zebra Longwing (*Heliconius charithonia*) – Fig. 51. Very rare migrant from the south with scattered records across the Piedmont and Coastal Plain over the past two decades. Records from mid-summer through late fall.

Variegated Fritillary (*Euptoieta claudia*) – Fig. 52. An almost year-long flier that is more numerous in the eastern half of the state—where it can be very common—than the western half—where it is generally common to uncommon.

Diana Fritillary (*Speyeria diana*) – Fig. 53. Generally uncommon along forest edges in the mountains (though it can be locally common in some locations during peak flight periods) and foothills. Males fly largely from early into mid-summer, females largely mid-summer into mid-fall.

Great Spangled Fritillary (*Speyeria cybele*) – Fig. 54. Common to locally abundant in the mountains, becoming fairly common to uncommon moving east across the Piedmont. Essentially absent from the Coastal Plain. Flies mid-spring through mid-fall.

Aphrodite Fritillary (*Speyeria aphrodite*) – Fig. 55. Limited almost entirely to the mountains, where it is common to very common in the northern half, fairly common in the southern half. Flies late spring into mid-fall.

Regal Fritillary (*Speyeria idalia*) – Unfigured. Once a rare visitor or resident in the northernmost mountain counties, now considered extirpated with no records since 1994. Records late summer to early fall.

Meadow Fritillary (*Boloria bellona*) – Fig. 56. Common in the mountains from early spring through mid-fall, more numerous in the north, less numerous in the south. Scattered records from the northwestern Piedmont.

Gorgone Checkerspot (*Chlosyne gorgone*) – Unfigured (See comments in introduction). Once very rare in May in mountain counties bordering Georgia, it may no longer occur in the state, as the species has not been reported in more than a decade.

Silvery Checkerspot (*Chlosyne nycteis*) – Fig. 57. Sometimes common in the mountains, becoming locally common to uncommon in much of the Piedmont. Essentially absent from the Coastal Plain. Multi-brooded with flights spring into early fall.

Texan Crescent (*Anthanassa texana seminole*) – Unfigured (See comments in introduction). A very rare stray with several records from the far southeastern corner of the state. Records from May and October.

Phaon Crescent (*Phyciodes phaon*) – Fig. 58. Limited largely to the immediate coast in the southeastern Coastal Plain, though ranges up through the Outer Banks. Generally locally common in the southeast in spring and summer, it can be abundant at some sites in fall.

Pearl Crescent (*Phyciodes tharos*) – Fig. 59. Very common and widespread across the state. Flies early spring to late fall.

Northern Crescent (*Phyciodes coctya incognitus*) – Fig. 60. Described in 2004 as a new, cryptic species ('Mimic' Crescent), this taxon has since been reclassified as a subspecies of Northern Crescent. It is limited to the Mountain Province, where it is considered uncommon to locally common. The challenges involved with separating it from *P. tharos* render its true status uncertain. Flies early spring to mid-summer.

Tawny Crescent (*Phyciodes batesii maconensis*) – Fig. 61. Limited to the southern half of the Mountain Province, where it is considered rare to locally uncommon, though it can be fairly common in a few locations. A spring and early summer flier.

Baltimore Checkerspot (*Euphydryas phaeton*) – Fig. 62. A habitat-restricted, colonial species that is sparsely distributed throughout the Mountain Province. Rare to locally numerous, though ephemeral, from mid-spring through mid-summer.

Question Mark (*Polygonia interrogationis*) – Fig. 63. Occurs statewide. Most common in the Piedmont, becoming less so in the higher mountains and lower Coastal Plain. An almost year-round flier.

Eastern Comma (*Polygonia comma*) – Fig. 64. Distribution and abundance similar to that of the previous species, though it is considered the less common of the two. Like *P. interrogationis*, flies almost all year.

Green Comma (*Polygonia faunus*) – Fig. 65. A primarily fall-flying species that occurs in the middle and southern regions of the mountains—historical records from the north. Rare to very rare, it appears to be on the decline.

Gray Comma (*Polygonia progne*) – Fig. 66. The least common of the *Polygonia*s, it is poorly understood. Sparsely distributed across the mountains—a bulk of records coming from the northern one-third—where it is extremely to very rare. Records span from May into October, though only a handful have occurred during the past decade.

Compton Tortoiseshell (*Nymphalis l-album*) – Fig. 67. Accidental with one record from the northern coast in mid-August.

Mourning Cloak (*Nymphalis antiopa*) – Fig. 68. Widespread across the state, though considered generally uncommon. Most numerous in the mountains, becoming less so across the Piedmont. In the Coastal Plain it is very uncommon to rare. Flight period primarily late winter into early summer.

Milbert's Tortoiseshell (*Aglais milberti*) – Unfigured. Accidental with one historical record from the eastern Piedmont in November.

American Lady (*Vanessa virginiensis*) – Fig. 69. Widespread and common across the state. Flies virtually the entire year.

Painted Lady (*Vanessa cardui*) – Fig. 70. Migratory species from the south and southwest that occurs statewide, but in greatly fluctuating numbers from year to year. Typically much less common than the previous species. Flies mostly summer through fall, when in greatest abundance.

Red Admiral (*Vanessa atalanta*) – Fig. 71. Occurs statewide through much of the year. Generally common in the mountains and Coastal Plain, generally uncommon in the Piedmont.

Mimic (*Hypolimnas misippus*) – Fig. 72. This species has been recorded three times in the state—all from September and October—though origin remains open to question.

Common Buckeye (*Junonia coenia*) – Fig. 73. Common and widespread across the state, though most numerous in the eastern half. Flies early spring into early winter, being most abundant in late summer and fall.

White Peacock (*Anartia jatrophae*) – Fig. 74. A casual stray from the south with fewer than ten records, all but one from along the coast in late summer and fall.

Red-spotted Purple (*Limenitis arthemis astyanax*) – Fig. 75. Widespread across the state. Common in the mountains and Piedmont, common to uncommon in some areas in the Coastal Plain. Flies early spring into mid-fall.

Viceroy (*Limenitis archippus*) – Fig. 76. Occurs statewide, though most common in the eastern half. Becomes generally uncommon in the west. Flies early spring into late fall.

Goatweed Leafwing (*Anaea andria*) – Unfigured. Accidental or casual with three records, all from the southern mountains, though only one, from mid-summer, within the last fifteen years.

Hackberry Emperor (*Asterocampa celtis*) – Fig. 77. Common to locally common in the Piedmont, uncommon to rare in the mountains. Uncommon to rare in the western and northern Coastal Plain, and virtually absent from the remainder of that province. Flies mid-spring to early fall.

Tawny Emperor (*Asterocampa clyton*) – Fig. 78. Generally uncommon in most of Piedmont, rare in upper Coastal Plain, very rare in lower Coastal Plain and mountains. Flies mid-spring through mid-fall.

Southern Pearly-eye (*Lethe portlandia*) – Fig. 79. Locally common in the Coastal Plain, uncommon in much of Piedmont, very rare to absent in most of foothills and mountains. Flies early spring through fall.

Northern Pearly-eye (*Lethe anthedon*) – Fig. 80. Common to locally common in the mountains, locally common to uncommon in most of Piedmont, absent from all but northeastern corner of Coastal Plain. Flies largely mid-spring to mid-fall.

Creole Pearly-eye (*Lethe creola*) – Fig. 81. Present across much of Coastal Plain and Piedmont, though generally uncommon to rare and local. Absent from all but a handful of southern counties in the mountains, where rare. Flight period similar to the other pearly-eyes.

Appalachian Brown (*Lethe appalachia*) – Fig. 82. Uncommon to locally common in locations in mountains and much of Piedmont, rare in northern and southern portions of Coastal Plain, absent in between. Like the pearly-eyes, flies mid-spring to mid-fall.

Gemmed Satyr (*Cyllopsis gemma*) – Fig. 83. Common to uncommon across Piedmont, uncommon to rare in mountains, very uncommon to rare in Coastal Plain. Flies early spring through mid-fall.

Carolina Satyr (*Hermeuptychia sosybius*) – Fig. 84. Widespread and common across the state, though more abundant in the Coastal Plain and Piedmont than the mountains. Flies early spring through mid-fall.

Intricate Satyr (*Hermeuptychia intricata*) – Fig. 85. Until recently, only a handful of records of this newly described species—mostly specimens—were known from several counties in the mid-Coastal Plain. Little is known about it, including flight period, but apart from an early May record, all records have been from mid-August to early September.

Georgia Satyr (*Neonympha areolatus*) – Fig. 86. Found in savannas in the southeastern Coastal Plain and a few sites north of north of Pamlico Sound. Generally uncommon but locally common in a few sites. Two-brooded, flying spring into early summer, and late summer into mid-fall.

Helicta Satyr (*Neonympha helicta*) – Fig. 87. Found in the northeastern portion of the Coastal Plain, the Sandhills and surrounding areas, and a few scattered locations in the eastern Piedmont. Appears to be in strong decline. Little if any known range overlap with *N. areolatus*. As with *N. areolatus*, two broods with similar flight periods.

Mitchell's Satyr (*Neonympha mitchellii francisci*) – Fig. 88. Rare, highly localized, and habitat-restricted. Currently known only from only two counties in the Sandhills. Populations tenuous and inaccessible to the public. Breeding and flight profiles similar to those of other *Neonymphas*.

Little Wood-Satyr (*Megisto cymela*) – Fig. 89. Widespread across the state. Common to locally common in the mountains and Piedmont, locally common to uncommon in the Coastal Plain. Peak flight in spring, diminishing into mid-summer.

Common Wood-Nymph (*Cercyonis pegala*) – Fig. 90. Occurs statewide, being locally common to very common in the northern mountains and generally uncommon elsewhere. Flies early summer to mid-fall.

Monarch (*Danaus plexippus*) – Fig. 91. Occurs statewide, being generally common to uncommon everywhere. On the wing somewhere the entire year, though most abundant late summer through late fall.

Queen (*Danaus gilippus*) – Fig. 92. Very rare fall migrant from the south with scattered records from along the coast, especially in the southeastern corner of the Coastal Plain.

Soldier (*Danaus eresimus*) – Fig. 93. Accidental stray from the south with two records from the coast in July.

Acknowledgements: My sincere thanks to all the photographers who so generously allowed their images to be used in this article. Thank you to Harry LeGrand, Jr. for reviewing select photographs, to Jeff Pippen for reviewing the species accounts, and to Steve Hall for reviewing other content. Each offered suggestions that improved this article, and any inaccuracies that remain are the sole responsibility of the author. I wish to acknowledge and thank Jeff Beane, Derb Carter, Mary Doll, Randy Emmitt (www.rlephoto.com), John Ennis, J. Merrill Lynch, and Britta Muiznieks for their assistance. Finally, my deepest gratitude to my wife Holly for accompanying me on countless trips afield, and for her unwavering support of all of my Lepidoptera-related activities.

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QUEEN BUTTERFLIES, *DANAUS GILIPPUS BERENICE* (CRAMER) (DANAIDAE: DANAINAE), ATTRACTED TO CUT STEMS OF COMMON RAGWEED, *AMBROSIA ARTEMISIIFOLIA* L. (ASTERACEAE), IN SOUTHERN FLORIDA

BY

MARC C. MINNO

While looking for butterflies at the Arthur R. Marshall Loxahatchee National Wildlife Refuge in Palm Beach County, Florida, on May 27, 2016, I encountered at least six males of the queen butterfly (Fig. 1) feeding on sap of cut stems of common ragweed. The plants were growing along a canal bank that had recently been mowed. These male butterflies were likely attracted to pyrrolizidine alkaloids in the sap. Male danaines, such as the queen, are well known for seeking out plants with pyrrolizidine alkaloids (Dussourd *et al.* 1989). These chemicals are converted by the adult butterflies into the males' courtship pheromone.

Fig. 1. *Danaus gilippus* males feeding at cut common ragweed stems at Loxahatchee National Wildlife Refuge, Florida.

Literature Cited

Dussourd, D. E., C. A. Harvis, J. Meinwald, and T. Eisne, 1989. Paternal allocation of sequestered plant pyrrolizidine alkaloid to eggs in the dainaine butterfly, *Danaus gilippus*. *Experientia* 45(9):896-898.

(Marc C. Minno, E-Mail: marc.minno@gmail.com)

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WELCOME TO OUR NEW MEMBERS

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Gainesville, FL 32609

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Enfield, NC 27823

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Ms. Jean Evoy
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COMMON BUCKEYES, *JUNONIA COENIA* HÜBNER (NYMPHALIDAE, NYMPHALINAE), FEEDING AT BAHIAGRASS, *PASPALUM NOTATUM* FLÜGGÉ (POACEAE), FLOWERS

BY

MARC C. MINNO

Fig 1. Two individuals of *Junonia coenia* feeding at bahiagrass flowers.

I recently published notes regarding adults of the corn earworm moth [*Helicoverpa zea* (Boddie)] [*Southern Lepidopterists' News* 36(1):26] and also a butterfly (*Hermeuptychia* species) [*Southern Lepidopterists' News* 36(4):160-161] visiting bahiagrass flowers and seedheads. In addition I have new observations of common buckeyes feeding at bahiagrass flowers. One adult was observed feeding at the flowers of this grass on July 24, 2016, at the Archbold Biological Station in Highlands County, Florida, on a hot, humid day. The grass was growing along a fire break.

On August 20, 2016 I visited the Ocmulgee National Monument near Macon, Georgia (Bibb County) and observed two common buckeyes feeding at bahiagrass flowers (Fig. 1) at the Earth Lodge. There were many other common buckeyes present and a lot of bahiagrass flower stalks, but only two adults were seen feeding at the flowers of this plant.

I tasted several flowering spikes of bahiagrass, but there was not much flavor. No sweetness was detected.

(Marc C. Minno, E-Mail: marc.minno@gmail.com)

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MANY THANKS TO THE FOLLOWING DONORS TO THE SOUTHERN LEPIDOPTERISTS' SOCIETY

(June - December 2016)

Contributor	**Benefactor +**
James Adams	***John Douglass***
Vernon Brou	***Tom Neal***

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A BLACK WITCH MOTH, *ASCALAPHA ODORATA* (LINNAEUS) (EREBIDAE) IN NORTHERN FLORIDA

BY

MARC C. MINNO, JEFFREY R. SLOTTEN, AND THOMAS NEAL

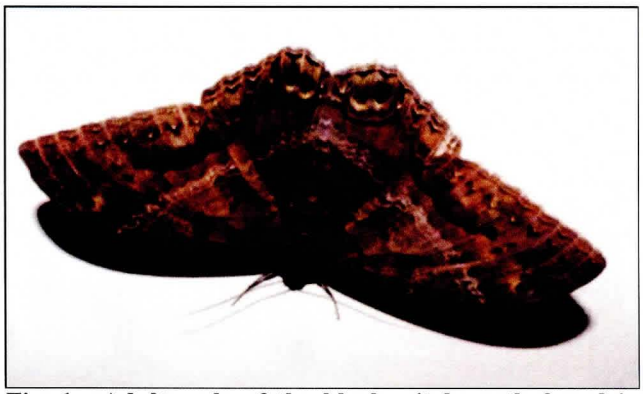

Fig. 1. Adult male of the black witch moth found in Gainesville on June 10, 2016.

The black witch moth is a locally common species in southern Florida and coastal areas of central Florida. However, this tropical moth is uncommon elsewhere in the state. Kimball (1965) listed just a few captures in June, July, September, and November from Gainesville. Kons and Borth (2006) only had four localities where they had found this moth in northern Florida, three in Gainesville and the Katherine Ordway Preserve in Putnam County. For many years J. R Slotten and T. Neal have run light and bait traps in their yards in Gainesville and have searched for moths at lights in other places around Alachua County and have only seen a few adults of the black witch.

During the early morning of June 10, 2016, my wife, Maria Minno, found a male black witch moth at our front porch light on 35th Terrace in Gainesville (Fig. 1). It is the first black witch that I have seen at our home. Individuals of the black witch have been known to disperse widely during the summer and fall and occasionally are found in northern states (Butterflies and Moths of North America -http://www.butterfliesandmoths.org/species/Ascalapha-odorata).

Literature

Kimball, C. P., Jr., 1965. *The Lepidoptera of Florida: An annotated checklist.* Florida Department of Agriculture, Division of Plant Industry, Gainesville. 363 pp. 26 plates.

Kons, H. L., Jr. and R. J. Borth, 2006. *Contributions to a study of the diversity, distribution, habitat association, and phenology of the Lepidoptera of northern Florida.* North American Lepidoptera Biodiversity Volume 1: vii + 229 pp.

(Marc C. Minno, E-Mail: marc.minno@gmail.com)

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Hybrid pitcher plant, *Sarracenia leucophylla* X *S. rubra wherryi*, Baldwin Co., Alabama. Photo by Carol Wolf (SLS Spring 2016 Field trip).

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PLEASE SUPPORT OUR WONDERFUL SL NEWS
BY
JOHN F. DOUGLASS

Members in attendance at the ATL-SLS Annual Meeting in Gainesville (October 2016) enthusiastically affirmed the importance of the SL NEWS in promoting members' interests, and its wonderful effectiveness in doing so.

We are fortunate to have such an arrestingly-beautiful, top-notch publication! Its mix of interesting articles, beautiful color photos, and superb editing has led members to comment that ours is the country's best regional lep newsletter.

Production and mailing costs of the NEWS represent the Society's biggest expense each year. The actual cost per member is about $40 per year, and membership dues currently cover two-thirds of this. Success of the NEWS continues to rely upon the generosity of donors.

In light of this, and in order to help maintain the NEWS at its current high level of excellence, members at the October 2016 Business Meeting voted to raise dues in the organization, beginning in 2017, by $5 for all membership categories (student dues will remain the same). A "Publication Fund" has been established, too, for the purpose of helping support production of the NEWS.

The new fund has been seeded with $3k from interested members, and we hope the account will continue to grow! Our Treasurer, Jeff Slotten, will happily accept any contribution, large or small, for this worthy cause. Donations made will be of lasting value in that our NEWS will continue to ignite and disseminate members' activities and ideas!

REPORTS OF STATE COORDINATORS

Alabama: C. Howard Grisham, 573 Ohatchee Road, Huntsville, AL 35811, E-Mail: chgrisham@Comcast.net

List of butterfly species reported in Alabama in 2016 compiled by Vitaly Charny:

Silver-spotted Skipper	*Epargyreus clarus*
Long-tailed Skipper	*Urbanus proteus*
Hoary Edge	*Achalarus lycaides*
Southern Cloudywing	*Thoribes bathyllus*
Northern Cloudywing	*Thoribes pylades*
Confused Cloudywing	*Thoribes confusis*
Sleepy Duskywing	*Erynnis brizo*
Juvenal's Duskywing	*Erynnis juvenalis*
Horace's Duskywing	*Erynnis horatius*
Zarucco Duskywing	*Erynnis zarucco*
Wild Indigo Duskywing	*Erynnis baptisiae*
Common Checkered-Skipper	*Pyrgus communis*
Tropical Checkered-Skipper	*Pyrgus oileus*
Swarthy Skipper	*Nastra lherminier*
Clouded Skipper	*Lerema accius*
Least Skipper	*Ancyloxypha numitor*
Southern Skipperling	*Copaeodes minima*
Fiery Skipper	*Hylephila phyleus*
Sachem	*Atalopedes campestris*
Tawny-edged Skipper	*Polites themistocles*
Baracoa Skipper	*Polites baracoa*
Crossline Skipper	*Polites origenes*
Whirlabout	*Polites vibex*
Southern Broken-Dash	*Wallengrenia otho*
Northern Broken-Dash	*Wallengrenia egeremet*
Little Glassywing	*Pompeius verna*
Delaware Skipper	*Anatrytone logan*
Byssus Skipper	*Problema byssus*
Hobomok	*Poanes hobomok*
Zabulon Skipper	*Poanes zabulon*
Broad-winged Skipper	*Poanes viator*
Yehl Skipper	*Poanes yehl*
Dun Skipper	*Euphyes vestris*
Pepper and Salt Skipper	*Amblyscirtes hegon*
Reversed Roadside-Skipper	*Amblyscirtes reversa*
Lace-winged Roadside-Skipper	*Amblyscirtes aesculapius*
Common Roadside-Skipper	*Amblyscirtes vialis*
Bell's Roadside-Skipper	*Amblyscirtes belli*
Eufala Skipper	*Lerodea eufala*
Twin-spot Skipper	*Oligoria maculata*
Brazilian Skipper	*Calpodes ethlius*
Salt Marsh Skipper	*Panoquina panoquin*
Ocola Skipper	*Panoquina ocola*
Yucca Giant Skipper	*Megathymus yuccae*
Pipevine Swallowtail	*Battus philenor*
Zebra Swallowtail	*Eurytides marcellus*
Black Swallowtail	*Papilio polyxenes*
Eastern Tiger Swallowtail	*Papilio glaucus*
Spicebush Swallowtail	*Papilio troilus*
Palamedes Swallowtail	*Papilio palamedes*
Giant Swallowtail	*Papilio cresphontes*

Diana Fritillary (*Speyeria diana*)(Photo by Vitaly Charny)

Checkered White	*Pontia protodice*
Cabbage Butterfly	*Pieris rapae*
West Virginia White	*Pieris virginiensis*
Great Southern White	*Ascia monuste*
Falcate Orange Tip	*Anthocharis midea*
Orange Sulphur	*Colias eurytheme*
Southern Dogface	*Zerene cesonia*
Cloudless Sulphur	*Phoebis sennae*
Orange-Barred Sulphur	*Phoebis philea*
Barred Yellow	*Eurema daira*
Little Yellow	*Pyrisitia lisa*
Sleepy Orange	*Abaeis nicippe*
Dainty Sulphur	*Nathalis iole*
Harvester	*Feniseca tarquinius*
American Copper	*Lycaena phlaeas*
Great Purple Hairstreak	*Atlides halesus*
Juniper Hairstreak	*Mitoura grynea*
Henry's Elfin	*Callophrys henrici*
Eastern Pine Elfin	*Callophrys niphon*
Coral Hairstreak	*Satyrium titus*
Banded Hairstreak	*Satyrium calanus*
King's Hairstreak	*Satyrium kingi*
Striped Hairstreak	*Satyrium liparops*
Red-banded Hairstreak	*Calycopis cecrops*
Gray Hairstreak	*Strymon melinus*
White M Hairstreak	*Parrhasius m-album*
Eastern Tailed-Blue	*Cupido comyntas*
Spring Azure	*Celastrina ladon*
Summer Azure	*Celastrina neglecta*
Little Metalmark	*Calephelis virginiensis*
American Snout	*Libytheana carinenta*
Monarch	*Danais plexippus*
Gulf Fritillary	*Agraulis vanillae*
Zebra Heliconian	*Heliconius charithonia*
Variegated Fritillary	*Euptoieta claudia*
Diana Fritillary	*Speyeria diana*
Great Spangled Fritillary	*Speyeria cybele*
Silvery Checkerspot	*Chlosyne nycteis*
Phaon Crescent	*Phyciodes phaon*
Pearl Crescent	*Phyciodes tharos*
Texan Crescent	*Anthanassa texana*
Baltimore	*Euphydryas phaeton*
Common Buckeye	*Junonia coenia*
Question Mark	*Polygonia interrogationis*
Eastern Comma	*Polygonia comma*
Mourning Cloak	*Nymphalis antiopa*
Red Admiral	*Vanessa atalanta*
American Lady	*Vanessa virginiensis*
Red-spotted Purple	*Limenitis arthemis astyanax*
Viceroy	*Limenitis archippus*
Goatweed Leafwing	*Anaea andria*
Hackberry Emperor	*Asterocampa celtis*
Tawny Emperor	*Asterocampa clyton*
Southern Pearly-Eye	*Lethe portlandia*
Northern Pearly-eye	*Lethe anthedon*
Creole Pearly-eye	*Lethe creola*
Appalachian Brown	*Lethe appalachia*

Mitchell's Satyr (*Neonympha mitchellii*)(Photo by Vitaly Charny)

Gemmed Satyr	*Cyllopsis gemma*
Carolina Satyr	*Hermeuptychia sosybius*
Intricate Satyr	*Hermeuptychia intricata*
Georgia Satyr	*Neonympha areolatus*
Mitchell's Satyr	*Neonympha mitchellii*
Little Wood Satyr	*Megisto cymela*
Common Wood-Nymph	*Cercyonis pegala*

Arkansas: Mack Shotts, 514 W. Main Street, Paragould, AR 72450, E-Mail: cshotts@grnco.net

Mack sends in the following report from David Rupe:

David states: "Had several individuals of *Melanchroia chephise* at my place on Cove Creek Rd in Washington County, Arkansas on 18-October-2016. Saw a similar occurrence back in 2007 in central and west-central Arkansas; was surprised to see so many in the Ozarks this year. Collected one individual and observed 7 total, all nectaring on aster."

***Melanchroia chephise* (Photos by David Rupe)**

Florida: Charles V. Covell Jr., 207 NE 9th Ave, Gainesville, FL 32601, E-Mail: covell@louisville.edu

Charlie sends in the following Florida reports for September 1 to November 20, 2016:

Jean Evoy of Arcadia, FL, recently rejoined the Southern Lepidopterists Society and sent Charlie the following report:

Butterflies observed during a Peace River Butterfly Society field trip to the Babcock/Webb Wildlife Management area in Charlotte County on Nov 1, 2016:

Papilio polyxenes (Black Swallowtail),
Papilio troilus (Spicebush Swallowtail),
Eurema daira (Bared Yellow),
Strymon istapa modesta (Mallow Scrub Hairstreak),
Calephelis virginiensis (Little Metalmark)
Agraulis vanillae (Gulf Frittilary),
Phyciodes tharos (Pearl Crescent),
Junonia coenia (Common Buckeye),
Anartia jatrophae (White Peacock),
Limeniitis archippus (Viceroy observed mating),
Neonympha areolata (Georgia Satyr), and
Anatrytone logan (Delaware Skipper).

Jean also provided a list of moths she has photographed in DeSoto County, Florida, during the past few months:

Tineidae:
Stenoptinea auriferella 9/14/16

Psychidae Psychids, Bagworm Moths:
Cryptothelea nigrita 11/4/16

Gracillariidae:
Caloptilia stigmatella 10/22/16

Elachistidae:
Eupragia hospita 11/11/16
Antaeotricha vestalis 11/10/16
Antaeotricha humilis 11/7/16
Antaeotricha leucillana 9/14/16

Autostichidae:
Autosticha kyotensis 8/16/16

Coleophoridae:
Blastobasis glandulella 11/5/16

Cosmopterigidae:
Euclemensia bassettella 9/25/16

Gelechiidae:
Arogalea cristifasciella 11//5/16
Anacampsis coverdalella 10/20/16
Taygete gallaegentiella 9/30/16

Tortricidae:
Zomaria andromedana 11/6/16
Eumarozia malachitana 11/5/16
Amorbia concavana 10/25/16
Gymnandrosoma punctidiscana 9/23/16

Bactracherdridae:
Homaledra sabalella 9/20/16

Crambidae:
Urola nivalis 11/10/16
Eudonia strigalis 11/6/16
Crambus satrapellus 11/5/16
Undulambia polystichalis 11/3/16
Omiodes indica 10/31/16
Ategumia ebulealis 10/26/16
Blepharomastix differentials 10/26/16
Microcuasta flavipunctalis 10/25/16
Herpetogramma phaeopteralis 10/25/16
Herpetogramma bipunctalis 10/24/16
Raphiptera argillaceellus 10/24/16
Diaphania modialis 10/22/16
Glaphyria basiflavalis 9/24/16
Glaphyria sequistrialis 9/20/16
Crambus quinquareatus 9/20/16
Chalcoela pegasalis 9/13/16
Eoparargyractis irroratalis 9/10/16
Diasemiopsis leodocusalis 9/7/16

Pyralidae:
Etiella zinkenella 11/10/16
Basacallis tarachodes 11/5/16
Phycitodes reliquella 10/22/16
Caudellia apyrella 10/23/16
Moodna ostrinella 9/23/16
Atascosa glareosella 9/11/16

Pterophoridae:
Hellinsia balanotes 10/28/16

Geometridae:
Costaconvexa centrostrigaria 11/9/16
Nemoria elfa 11/4/16
Synchlora frondaria 10/31/16
Phrudocentra centrifugaria 10/21/16
Scopula aemulata 11/10/16
Leptostales laevitaria 11/3/16
Lophosis labeculata 11/10/16

Saturniidae:
Anisota virginiensis 10/24/16
Automeris io 11/6/16

Sphingidae:
Enyo lugubris 10/2/16
Xylophones tersa 10/27/16
Eumorpha fasciatus 9/25/16
Amphion floridensis 8/15/16

Notodontidae:
Lochmaeus bilineata 8/14/16
Datana integerrima (caterpillar) 8/26/16

Erebidae:
Mocis latipes 11/10/16
Nigetia formosalis 11/6/16
Rivula pusilla 11/6/16
Phyprosopus callitrichoides 11/6/16
*Anomis illita*11/5/16
Utetheisa ornatrix 11/6/16
Antiblemma concinnula 11/1/16
Cisthene striata 10/31/16
Anticarsia gemmatalis 10/25/16
Selenisa sueroides 11/9/16
Redectis vitrea 10/24/16
Idia aemula 9/28/16
Ephyrodes cacata 9/23/16
Clemensia albiata 9/17/16
Hypoprepia fucosa 9/16/16
Hypercompe scribonia 9/11/16

Noctuidae:
Eudryas unio 11/6/16

Orzaba nebula 11/04/16
Acronicta afflicta 11/1/16
Janseodes melanospila 11/1/16
Acherdoa ferraria 10/31/16
Hormoschista latipalpis 10/26/16
Spodoptera ornithogalli 10/25/16
Oruza albocostaliata 9/11/16

Nolidae:
Nola cereella 11/1/16

Charlie's Gainesville, Alachua County, butterfly records:

This period was marked by heavy rains in late summer with effects from hurricanes Hermine and Matthew, which grazed our area and did only moderate damage. Hermine dropped heavier rain – about 5 inches within the Sept. 1 – 3 period, and Matthew about 2 inches at our home Oct. 7. After that it has been quite dry for most of Oct. – Nov. as in much of the SE United States.

Papilio glaucus, Sept. 2, 10
Papilio troilus, Sept. 2, 7, 8, 10, 12, 17, 20, Oct. 3
Phoebus sennae, Sept. 2, 7, 8, 10, 12, 14, 16, 17, 20, 26, Oct. 12, 14, 15, 16, 19, 22, 24, 25, Nov. 4, 5, 7, 11, 16
Abaeis nicippe, Sept. 5, 10, 12, 17, 20, Oct. 5, 14, 15, 25, Nov. 4
Asterocampa clyton, Sept. 5
Urbanus proteus, Sept. 7, 8, 12, 16, 20, 26, Oct. 11, 12, 14, 15, 16, 19, 22, 24, 25, Nov. 4, 5, 7, 16, 17, 20
Anatrytone logan, Sept. 7
Agraulis vanillae, Sept. 7, 8, 10, 12, 16, 17, 18, 20, Oct. 3, 5, 10, 12, 14, 15, 16, 19, 22, 24, Nov. 4, 5, 6, 7, 11, 12, 16, 17
Hylephila phyleus, Sept. 7, 10, 16, 17, 20, Oct. 14, 15, 22, Nov. 4, 5
Heraclides cresphontes, Sept. 7, 12, 20, Oct. 3, 10, Nov. 17
Papilio palamedes, Sept. 8, 16, Oct. 16
Battus polydamas, Sept. 8, 26, Oct. 19
Heliconius charithonia, Sept. 8, 10, 12, 14, 17, 18, 20, 25, 26, Oct. 3, 5, 10, 12, 15, 16, 19, 24, Nov. 4, 7, 10, 11, 16, 17
Asbolis capucinus, Sept. 12, 18
Panoquina ocola, Sept. 12, 17, Oct. 15, 22, 24, 25, Nov. 7
Ancyloxipha numitor, Sept. 17, Oct. 15, 19, 26
Danaus plexippus, Sept. 18, Oct. 5, 12, 24, Nov. 4, 5, 6, 7, 11, 16
Lerema accius, Oct. 5, 12
Pyrisitia lisa, Oct. 11, 14, 22, Nov. 4, 5, 12
Atlides halesus, Oct. 14
Junonia coenia, Oct. 14, 15, 22, Nov. 5, 11, 12, 16
Leptotes cassius, Oct. 14, 25, Nov. 7, 17
Hemiargus ceraunus, Oct. 19, 26, Nov. 4, 10
Anartia jatrophae, Oct. 21, 25, 27 (all seen behind the McGuire Center)
Phoebus philea, Oct. 25, Nov. 16
Limenitis archippus, Nov. 5
Megisto cymela, Nov. 11
Vanessa atalanta, Nov. 16
Euphyes vestris Nov. 19

The Southern Lepidopterists Society and Association for Tropical Lepidoptera moth field trip to Paynes Prairie Preserve State Park (PPPSP), Alachua County, was held on the evening of October 28.

Participants included: Debbie Matthews, Terry Lott, Eric Anderson, James Hayden, James K. Adams, Brian Scholtens, Jeff Slotten, Lance Durden, David Plotkin, Jorge Martinez, Bob Beriger, John Pickering, Vijay Barve, Jae Clayborn, Yadira Reynaldo, and Charlie Covell.

This list was generated mostly by James Adams, with additions from Debbie Matthews, Eric Anderson, James Hayden, Lance Durden, Jeff Slotten and C. V. Covell. Several have not yet reported. We have 14 species new to the PPPSP list, plus one "genus name only" (these names in boldface)

PSYCHIDAE:
0442 *Cryptothelea gloverii* (Packard)

ATTEVIDAE:
2401 *Atteva aurea* (Fitch)

TORTRICIDAE:
2749 *Eumarozia malachitana* (Zeller)

LIMACODIDAE:
4681 *Isa textula* (Herrich-Schaffer)
4697 *Euclea delphinii* (Boisduval)

CRAMBIDAE:
4745 *Chrysendeton kimballi* Lange
4748 *Elophila iccusalis* (Walker)
4755 *Elophila obliteralis* (Walker)
4764 *Parapoynx allionealis* Walker
4785 *Eoparagyractalis irroratalis* (Dyar)
4940 *Oenobotys vinotinctalis* (Hampson)
4953 *Anania tertialis* (Guenée)
5143 *Diacme adipaloides* (Grote. & Robinson)
5151 *Samea multiplicalis* (Guenée)
5158 *Ategumia ebulealis* (Guenée)
5159 *Desmia funeralis* (Hübner)
5172 *Diasemiodes janassalis* (Walker) (or the following; could be both)
5174 *Diathrausta reconditalis* (Walker)
5205 *Diaphania modialis* (Dyar)
5226 *Palpita magniferalis* (Walker)
5284 *Syngamia florella* (Stoll)
5286 *Salbia mizaralis* (Druce)
5287.1 *Salbia* sp.
5292 *Conchylodes ovulalis* (Guenée)
5314 *Donacaula unipunctellus* (Robinson)
5456 *Microcausta flavipunctalis* Barnes & McDunnough
5463 *Argyria lacteella* (Fabricius)
5464 *Urola nivalis* (Drury)
5530 *Hypsopygia binodulalis* (Zeller) *Dolichomia*? (This and next)
5533 *Hypsopygia olinalis* (Guenée)
5853 *Dioryctria amatella* (Hulst)
6037 *Cabnia myronella* Dyar

PTEROPHORIDAE:
6099.1 *Exelastis pumilio* (Zeller)
6122 *Stenoptilodes brevipennis* (Zeller)
6154 *Pselnophorus belfragei* (Fish)
6155.1 *Adaina simlicius* (Grossbeck)

GEOMETRIDAE:
6335 *Macaria aequiferaria* Walker)
6336 *Macaria distribuaria* Hübner
6339 *Macaria transitaria* (Walker)
6341 *Macaria bicolorata* (Fabricius)
6443 *Glenoides texanaria* (Hulst)
6654 *Hypagyrtis unipunctata* (Haworth)
6743 *Xanthotype* sp. near *sospeta* (Drury)
6745 *Cymatophora approximaria* Hübner
6941 *Eusarca confusaria* Hübner
6982 *Prochoerodes lineola* (Goeze)
7059 *Synchlora frondaria* Guenée
7122 *Idaea tacturata* (Walker)
7132 *Pleuroprucha insulsaria* (Guenée)
7136 *Cyclophora packardi* (Prout)
7137 *Cyclophora myrtaria* (Guenée)
7152 *Scopula compensata* (Walker)
7160 *Scopula timandrata* (Walker)
7173 *Leptostales pannaria* (Guenée)
7181 *Lophosis labeculata* (Hulst)
7474 *Eupithecia miserulata* Grote
Eupithecia sp.

LASIOCAMPIDAE:
7683 *Artace cribraria* (Ljungh)

SPHINGIDAE:
7851 *Enyo lugubris* (Linnaeus)

NOTODONTIDAE:
7994 *Heterocampa guttivitta* (Walker)
8007 *Schizura unicornis* (J. E. Smith)

LYMANTRIIDAE:
8307 *Dasychira manto* (Strecker)

ARCTIIDAE (or **EREBIDAE**, subfamily Arctiinae):
8045 *Crambidia pallida* Packard
8067 *Cisthene plumbea* Stretch
8071 *Cisthene subjecta* Walker
8090 *Hypoprepia fucosa* (Hübner)
8098 *Clemensia albata* Packard
8106 *Utetheisa bella* (Linnaeus) (=ornatrix)
8121 *Holomelina aurantiaca* (Hübner)
8137 *Spilosoma virginica* (Fabricius)
8169 *Apantesis phalerata* (Harris)
8203 *Halysidota tessellaris* (J. E. Smith)
8280 *Cosmosoma myrodora* Dyar

NOCTUIDAE (EREBIDAE + NOCTUIDAE *sensu stricta*):
8322 *Idia americalis* (Gn.)
8329 *Idia diminuendis* (Barnes & McDunnough)
8341 *Zanclognatha theralis* (Walker)
8343 *Zanclognatha minoralis* J. B. Smith
8346 *Zanclognatha atrilineella* (Grote)
8357.1 *Macrochilo hypocritalis* Ferguson
8360 *Macrochilo orciferalis* (Walker)
8361 *Macrochilo louisiana* (Forbes)
8376 *Hypenula cacuminalis* (Walker)
8385 *Renia fraternalis* J. B. Smith
8393 *Lascoria ambigualis* Walker
8398 *Palthis asopialis* (Guenée)

8431 *Schrankia macula* (Druce)
Sigela n.sp.
8488 *Hormoschista latipalpis* (Walker)
8574 *Anticarsia gemmatalis* Hübner
8579 *Antiblemma concinnula* (Walker)
8651 *Lesmone detrahens* (Walker)
8689 *Zale lunata* (Drury)
8733 *Caenurgia chloropha* (Hübner)
8743 *Mocis latipes* (Guenée)
8744 *Mocis marcida* (Guenée)
8745 *Mocis texana* (Morrison)
8794 *Catocala lacrymosa* Guenée
8973.1 *Afrida ydatodes* Dyar
8983.1 *Meganola phylla* (Dyar)
9057 *Homophoberia apicosa* (Haworth)
9168 *Bagisara repanda* (Fab.)
9297.2 *Elaphria cyanympha* Ferguson
9526 *Bellura densa* (Walker)
9463 *Parapamea buffaloensis* (Grote)
9650 *Athetis tarda* (Guenée)
9676 *Elaphria nucicolora* (Guenée)
9678 *Elaphria versicolor* (Grote)
9681 *Elaphria festivoides* (Guenée) complex
9687 *Gonodes liquida* (Möschler)
9693 *Condica mobilis* (Walker)
9698 *Condica concisa* (Walker)
9819 *Amolita obliqua* J. B. Smith
10438 *Mythimna unipuncta* (Haworth)
10450 *Leucania incognita* Barnes & McDunnough
10680.1 *Feltia floridensis* Lafontaine
10911 *Anicla infecta* (Ochsenheimer)
11149 *Schinia trifascia* Hübner

Total new: 13 or 14 species, plus. 1 identified to genus only
Trip total: 116 spp. (+ 3 to genus only)

Georgia: James K. Adams, 346 Sunset Drive SE, Calhoun, GA 30701, E-Mail: jadams@daltonstate.edu (Please check out the GA leps website at: http://www.daltonstate.edu/galeps/)

The contributors include James Adams (JKA or no notation), Brian Scholtens (BS), John Hyatt (JH) and Lance Durden (LD). Others are indicated with their records. Most records presented here represent new or interesting records (range extensions, unusual dates, uncommon species, county records, *etc.*), or more complete lists for new locations/new times of year. All known new STATE and COUNTY records are indicated, and all dates listed below are 2016 unless otherwise specified.

Carbondale, I-75 exit 326, Whitfield Co.:
GEOMETRIDAE: *Phaeoura quernaria*, Sept. 22 (BIZARRE FALL record). **SATURNIIDAE: SPHINGIDAE**: *Agrius cingulatus*, Sept. 6; *Manduca rustica*, Sept. 1; *Paonias astylus*, Aug. 30; *Enyo lugubris*, Sept. 19 and 26. **EREBIDAE**: *Catocala robinsoni*, Sept. 27; *C. neogama*, Oct. 5 (LATE). **NOCTUIDAE**: *Argyrogramma verrucae*, several, mid-Sept. to mid-Oct.; *Amyna bullula*, Nov. 11; *Papaipema furcata*, Oct. 2 & 13; *Condica confederata*, Nov. 8; *Lithophane patefacta*, Nov. 11; *Agnorisma bollii*, Nov. 11.

Rocky Face Ridgeline, just SW of Dalton, Whitfield Co., Oct. 10-11, JA:
NOCTUIDAE: *Papaipema polymniae.*

Calhoun, Gordon Co. (my house), Sept. 3:
NOCTUIDAE: *Schinia gracilenta, S. nundina.*

Salacoa Creek, 5 mi. ESE of Fairmount, Bartow Co.:
Sept. 4-5:
GEOMETRIDAE: *Idaea celtima.* **NOCTUIDAE**: *Basilodes pepita, Stiria rugifrons, Cirrhophanus triangulifer, Resapamea trigona, Papaipema polymniae, P. furcata.*
Sept. 17-18:
EREBIDAE: *Cisthene kentuckiensis.* **NOCTUIDAE**: *Papaipema cerrusata.*
Oct. 9-10:
SPHINGIDAE: *Agrius cingulatus.*

Taylor's Ridgeline, 5 mi. W of Villanow, Walker Co., Nov. 18, JA:
Although none of the butterflies listed here are exceptional, the late date is noteworthy.
HESPERIIDAE: *Pyrgus albescens* (or *communis*). **PIERIDAE**: *Pieris rapae, Phoebis sennae, Eurema lisa, Abaeis nicippe.* **NYMPHALIDAE**: *Agraulis vanillae, Euptoieta claudia, Polygonia comma, Phyciodes tharos, Danaus plexippus.* **SATURNIIDAE**: *Hemileuca maia.*

Rome, east side of Hwy1/27, 3.33 mi. N of Loop 1, mixed forest with rare Nutmeg Hickory (Carya myristicaformis), 34°19'34ish" N, 85°10'17ish" W, Sept. 4:
EREBIDAE: *Catocala myristica* (several; explored the site a bit more), *C. angusi* (COUNTY).

Marietta, NE from Kennesaw Mountain, 33°59'27.24"N 84°33'15.71"W, Cobb Co., Sept. 10, John Ziegler:
EREBIDAE: *Ascalapha odorata.*

Ohoopee Dunes, Tract 3 (Hall's Bridge Road), Oct. 15, JA with Patrick Adams:
GEOMETRIDAE: *Euchlaena deplanaria.* **NOCTUIDAE**: *Bagisara rectifascia, Eucoptocnemis dapsilis.*

Statesboro, Bulloch Co., LD:
SPHINGIDAE: *Manduca jasminearum.* 23 May; *Isoparce cupressi.* 20 Mar.; *Eumorpha achemon.* 13 Nov.

McIntosh Co., Townsend Wildlife Management Area, Pitcher Plant Bog, LD:
CRAMBIDAE: *Leptosteges parthenialis,* 9 Jul., 6 Aug. & 9 Sep (STATE). **NOCTUIDAE**: *Exyra semicrocea,.* 9 Jul. & 9 Sep. (LATE); *Anicla sullivani.* 9 Sep.

Sapelo Island, McIntosh Co:
August 23-24, LD:
PSYCHIDAE: *Prochalia pygmaea* (new to ISLAND)
Nov. 2-3, JH:
NOLIDAE: *Diphthera festiva.* **NOCTUIDAE**: *Agrotis vetusta.*

Doerun Pitcherplant Bog NA, 8 mi. NNW of Moultrie, JA and LD, Oct. 27-28:
TORTRICIDAE: *Eucosma adamantana* (STATE). **CRAMBIDAE**: *Duponchelia fovealis* (COUNTY). **GEOMETRIDAE**: *Macaria varidaria, Scopula compensata, S. lautaria.* **NOCTUIDAE**: *Photedes carterae.*

Louisiana: Michael Lockwood, 215 Hialeah Avenue, Houma, LA 70363, E-Mail: mikelock34@hotmail.com

Mississippi: Ricky Patterson, 400 Winona Rd., Vicksburg, MS 39180, E-Mail: rpatte42@aol.com

Ricky states the following - Weather has been hot and dry. Seems to have helped late season migrants, though:
24 September 2016, Noxubee National Wildlife Refuge, Oktibbeha county, *Phoebis agarithe* **STATE RECORD**, Photographed, Terry Schafer of Miss State Entomological Museum.

7 October 2016, Starkville, Oktibbeha county, *Ascia monuste* **COUNTY RECORD**, photographed.

North Carolina: Steve Hall, North Carolina Natural Heritage Program, Div. of Parks & Recreation, 1615 MSC Raleigh, NC 27699-1615, E-Mail: Stephen.Hall@ncmail.net

Steve sends in the following report for North Carolina:

The following selected butterfly records were submitted by Harry LeGrand, representing observations made from June through August 2016. Names in parentheses are counties.

Summer 2016 continued a string of recent summers with generally good to excellent rainfall and temperatures near normal or above normal. Thus, conditions were very good for butterflies in the state. Sadly, it was still another summer without a significant immigration of Southern species, except for *Panoquina ocola*; however, very early tropical systems did bring two strays (*Heliconius charithonia* and *Urbanus dorantes*) to the state in June. There was some input of *Pyrisitia lisa* into the region, mostly in the Sandhills, but there were practically no records of *Vanessa cardui* in the state. For some unknown reason, all of the Speyeria fritillaries (*S. cybele*, *S. aphrodite*, and *S. diana*) were unusually scarce in the mountains, and *Lycaena phlaeas* was practically impossible to find in the mountains, as well. There was another disturbing situation: due to locally abundant rainfall and concern for the Ziki virus, there was some obvious mosquito spraying of canals and ditches in some coastal areas, greatly impacting skippers and other

smaller butterfly species, especially wetland species.

PAPILIONIDAE:

Papilio cresphontes, in addition to a handful of expected coastal sightings, a stray seen near Hillsborough (Orange) by Lori Carlson on August 28 was one of the few records for the eastern Piedmont.

PIERIDAE:

Pontia protodice, the only seasonal report of this strongly declining species was one seen by David Campbell at Lexington (Davidson) on July 5.

LYCAENIDAE:

Satyrium titus, one seen by Bonnie Simmons on June 9 at 2,000' elevation near Old Fort (McDowell) was a very good find for the mountain foothills.

Satyrium caryaevorus, once again Doug Johnston photographed one, the sole report for the season, near Leicester (Buncombe) on June 17. He has photographed three of the last few recent reports of this very scarce species.

Satyrium kingi, though seen at the most reliable spot for them in the state – Weymouth Woods Preserve (Moore), Rob Van Epps had an excellent single-party count of 20 on June 12.

Satyrium liparops, Nick Flanders reported the only one of the season, at Alligator River National Wildlife Refuge (Dare) on the late date of June 29.

Satyrium favonius, one was photographed by Lori Carlson in her yard near Hillsborough (Orange) on June 9; the species is very rare away from coastal oak stands.

NYMPHALIDAE:

Heliconius charithonia, one seen by Susan Campbell at the McKinney Fish Hatchery in Richmond **(COUNTY)** on June 1 was most unusual for so early in the year and was presumably brought northward by a very early tropical storm (Bonnie).

Speyeria diana, Mike Turner saw a male on June 2 along Irish Buffalo Creek in Rowan **(COUNTY)**; this site is a slight eastward extension of the known range.

Chlosyne nycteis, there were two remarkable tallies on butterfly counts this season, both greatly surpassing the previous one-day state high count for the species (200). The Pilot Mountain State Park (Surry) count tallied a whopping 520 on August 24, whereas the Durham County count tallied 353 on August 21.

Vanessa cardui, the only report for the season was of one on the Southern Lake Norman (Mecklenburg) butterfly count on August 14.

Lethe creola, Jeff Pippen and Harry LeGrand saw two in the foothills in Caldwell **(COUNTY)** on August 23; the species is scarce in the northwestern part of the state.

Lethe appalachia, a surprising first record for Johnston **(COUNTY)** was two seen by Mike Turner on July 2 at Howell Woods Preserve.

Hermeuptychia intricata, on August 12 a concerted effort was made to look for and study this newly described species at a previously known site -- Island Creek (Jones). Harry LeGrand, Jeff Pippen, Jim Brock, and Steve Moore observed about 20 satyrs, probably all or nearly all *H. intricata*, based on many photos of both the dorsal and ventral sides taken by Pippen. Salman Abdulali visited the site on August 17 and observed several individuals. How numerous *H. sosybius* is at the site is not known; both species might be present. The distribution of *H. intricata* in the state – presumably limited to the Coastal Plain – needs much further study.

HESPERIIDAE:

Urbanus dorantes, one was seen by Jonathan Lelito at Raulston Arboretum in Raleigh (Wake) on June 12. This is surprisingly the third record for this locale, and the early season occurrence is presumably due to its being carried northward by Hurricane Colin.

Autochton cellus, Gail Lankford and party observed this great rarity in Madison County on July 14; Nancy Cowal provided a photograph. A state record late date – by 12 days – was a very worn individual seen on August 23 by Harry LeGrand and Jeff Pippen in Caldwell County.

Thorybes confusis, Harry LeGrand and Jeff Pippen had a good tally of four individuals in the Sandhills Game Land (Richmond) on August 4.

Erynnis martialis, the only summer sightings were, as usual, at Sandy Mush Game Land (Buncombe), where Doug Johnston saw one on July 17 and two were tallied there on the North Buncombe butterfly count on August 5.

Erynnis zarucco, the previous state one-day high count was just 25 individuals; thus, the excellent 65 tallied by Jeff Pippen and Harry LeGrand on August 4 in the Sandhills Game Land (Scotland) was quite notable.

Pyrgus albescens?, Harry LeGrand observed a fresh male that, based on the sandy roadside habitat, location, and thick gray hairs, appeared to be this species, which is numerous in nearby South Carolina but is very poorly known in North Carolina. He saw it along US 1 near Marston (Richmond) on July 16. There are specimens known from Carteret and Mecklenburg counties, and there are a few potential sight records (all from the southern part of the state).

Problema byssus, two were photographed by George Andrews at Cane Creek Park in Union **(COUNTY)** on June 12; this site lies along the northern edge of the expanding range of this species. He also photographed the species there in its second brood, on August 30. Also at the northern edge of the range were four seen by Mike Turner at Umstead State Park (Wake) on July 4. The Wake County butterfly count tallied three individuals on August 19 (fide John Connors).

Poanes viator, an excellent count at the inner edge of the range was nine seen south of Raleigh (Wake) on June 4, by Harry LeGrand and party.

Euphyes pilatka, Nick Flanders saw 10 along the Alligator River near Gum Neck (Tyrrell) on June 20; this is a good tally and a new site for the species.

Euphyes dukesi, though not a first county record, one seen by Nick Flanders on August 14 was at a new site – the Waterlily area (Currituck); the species is known from just a few sites in the northern coastal area.

Euphyes berryi, Jim Springer and Ahmet Baytas saw one at a new site within Alligator River National Wildlife Refuge (Dare) on August 29; this is at the northeastern corner of the species' range.

Atrytonopsis quinteri, Brian Bockhahn and John Fussell had a good tally of 31 individuals at Fort Macon State Park (Carteret) on July 28. However, the species had finished its second brood by August 12, as Harry LeGrand, Jeff Pippen, and party could not locate any despite a thorough search of the park on that date.

Amblyscirtes reversa, John Fussell had the season's only reports – singles in Croatan National Forest (Craven) on August 19-20.

Amblyscirtes vialis, Gail Lankford and party tallied a state record high count of 11 individuals on June 23 in Madison County. Jeff Pippen photographed one in Sandhills Game Land (Scotland) on August 4; the species is at the eastern edge of the range in the sandhills region.

Lerodea eufala, this species is very scarce in most of the Piedmont; thus quite notable were singles photographed at Pilot Mountain State Park in Surry **(COUNTY)** by Brian Bockhahn and party on August 24, seen at Wilkes Community College (Wilkes) by Gene Schepker and Lois Schneider on August 23, and seen at Hanging Rock State Park (Stokes) by Brian Bockhahn and party on August 31.

Calpodes ethlius, once again Tom Stock found the species near stands of canna at Duck (Dare); he noted two on July 31 and one on August 3. Much farther inland, Richard Stickney saw an adult at Yates Mill County Park (Wake) on August 22.

The following selected moth records were submitted by Ed Corey (EC) and Steve Hall (SPH). The records from Bladen County come from a bioblitz conducted at several state park units containing an assortment of natural lake shoreline marshes, swamps, pocosins, and sand ridges. Although the moon and temperature conditions seemed optimal, the results of two nights of sampling using several UV bucket traps, sheets, and one mercury-vapor set up were extremely poor – only 90 species were recorded and very few individuals. We suspect that the heavy flooding the area had experienced in the weeks preceding the Bioblitz may have been the cause, with or without additional impacts due to mosquito control.

CRAMBIDAE:

Elophila icciusalis, OCT 1, Bladen, SPH/EC (**COUNTY**)
Elophila tinealis, OCT 1, Bladen, SPH/EC (**COUNTY**)
Elophila obliteralis, OCT 1, Bladen, SPH/EC (**COUNTY**)
Pyrausta bicoloralis, OCT 1, Bladen, SPH/EC (**COUNTY**)
Rhectocraspeda periusalis, OCT 1, Bladen, SPH/EC (**COUNTY**)
Ategumia ebulealis, OCT 1, Bladen, SPH/EC (**COUNTY**)
Hymenia perspectalis, OCT 2, Bladen, SPH/EC (**COUNTY**)
Spoladea recurvalis, OCT 1, Bladen, SPH/EC (**COUNTY**)
Anageshna primordialis, OCT 1, Bladen, SPH/EC (**COUNTY**)

GEOMETRIDAE:

Haematopis grataria, SEP 7, Orange, SPH
Leptostales pannaria, SEP 30, Bladen, SPH/EC (**COUNTY**)
Xanthorhoe lacustrata, SEP 7, Orange, SPH (**COUNTY**)

NOTODONTIDAE:
Misogada unicolor, SEP 4, Orange, SPH (**COUNTY**)

EREBIDAE:
Crambidia pura complex, SEP 30, Bladen, SPH/EC (**COUNTY**)
Macrochilo louisiana, SEP 30, Bladen, SPH/EC (**COUNTY**)
Hormoschista latipalpis, SEP 30, Bladen, SPH/EC (**COUNTY**)
Arugisa latiorella, OCT 1, Bladen, SPH/EC (**COUNTY**)
Catocala piatrix, SEP 4, Orange, SPH (**COUNTY**)

NOCTUIDAE:
Elaphria nucicolora, SEP 30, Bladen, SPH/EC
Feltia geniculata, SEP 30, Bladen, SPH/EC (**COUNTY**)

South Carolina: Brian Scholtens, College of Charleston, Charleston, SC 29424, E-Mail: scholtensb@cofc.edu

Tennessee: John Hyatt, 233 Park Ridge Court, Kingsport, TN 37664, E-Mail: jkshyatt@centurylink.net

State Report John Hyatt:

TN: Sullivan Co., Kingsport, 6 Sept. 2016: *P. cresphontes* at flowers. First one seen here in about 6-8 years. Definitely a rarity in the mountains. Also, here's one noticeable by its absence: *A. vanillae* had an unusually abundant year in the southern Appalachians in 2015, beginning in July. But in 2016, not a single one has been seen... despite a moderate winter in these parts.

Texas: Ed Knudson, 8517 Burkhart Road, Houston, TX 77055, E-Mail: eknudson@earthlink.net

This report is for Oct-Nov 2016.

As you know, Charles Bordelon passed away in late Sept. 2016. It was strange and sad to be in south Texas without him.

I was at Falfurrias, Brooks Co., TX, on Oct. (3-X-16) and there were many moths coming to lights at the Best Western Motel. Interesting species included *Cacozelia pemphusalis* (Pyralidae) (new for area) and *Apilocrocis brumalis* (Crambidae) (also new for this spot). Along the Noctuids, there were 12 species of *Schinia* flying including many *Schinia maculata, S. regia, S. volupia, S. hanga, S. bicuspida*, and *Heliocheilus toralis*. One example of *Plagiomimicus caesium* was also there and this is a new county for it.

I spent the rest of the week (Oct.4-8) in Alamo, TX.(Hidalgo Co). There were not many butterflies there and nothing of real interest. Not too many moths either. I did get one small Alucitid (not sure which sp.) and a nice male specimen of *Acontia jaliscana*, which is rare, but not unusual. Little else worthwhile.

I returned to Alamo TX, Nov 7-11. The weather was mostly cloudy with intermittent rain. On the first night I got a perfect female of *Eumorpha labruscae*, which I had not seen from Hidalgo Co., but it is recorded from Mission. After that the rest was junk, although there were many moths at the lights.

The best Lepidopteran from the valley this year was *Hypocrita escuintla*, of which you will read about the way in which it was found, in the article by Mike Rickard in the issue. Oddly, there was a Florida specimen collected by Dale Habeck in Gaineville on Nov. 5, 1989. See Vol. 29, 1 in this Newsletter.

Virginia: Harry Pavulaan, P.O. Box 1124, Herndon VA 20172, E-Mail: pavulaan@aol.com

Harry sends in the following Virginia State Record:

Mulberry Wing Skipper (*Poanes massasoit hughi*) nectaring on Buttonbush (June 24, 2016, Goddins Pond, near Barharnsville, New Kent County VA). (Photo by Shirley Devan on next page.)

The following report is also sent in by Harry: All observations H. Pavulaan by sight, except others where noted. Numbers observed in parentheses.

Mullberry Wing Skipper (*Poanes massasoit hughi*) (Photo by Shirley Devan)

Pieris rapae – Albemarle Co.: vic. Crozet, 11/18/16 (1 obs: Mark Adams). Loudoun Co.: Leesburg, 11/18/16 (1); Leesburg, Ida Lee Park, 11/5/2016 (1). Richmond City: Maymont Park, 11/8/16 & 11/17/16 (many on both dates, obs: Bill Hark).

Colias philodice – Albemarle Co.: vic. Crozet, 11/18/16 (9 obs: Mark Adams). Loudoun Co.: Leesburg, Ida Lee Park, 11/5/2016 (3), 11/13/16 (1). Richmond City: Maymont Park, 11/8/16 & 11/17/16 (several on both dates, obs: Bill Hark).

Colias eurytheme – Albemarle Co.: vic. Crozet, 11/18/16 (5 obs: Mark Adams). Loudoun Co.: Leesburg, 11/18/16 (several observed in fields near Leesburg Airport); Leesburg, Ida Lee Park, 11/5/2016 (9), 11/13/16 (2). Richmond City: Maymont Park, 11/8/16 & 11/17/16 (several on both dates, obs: Bill Hark).

Phoebis sennae – Henrico Co.: 11/11/16 (1 on Lantana, obs: Bill Hark). Loudoun Co.: Leesburg, 9/9/16 (1). Richmond City: Maymont Park, 11/17/16 (1, obs: Bill Hark).

Calycopis cecrops – Loudoun Co.: Leesburg, Ida Lee Park, 11/5/2016 (1).

Strymon melinus – Loudoun Co.: Leesburg, Ida Lee Park, 11/13/16 & 11/18/16 (1 each date, one vouchered).

Everes comyntas – Loudoun Co.: Leesburg, Ida Lee Park, 11/5/2016 (1).

Euptoieta claudia – Albemarle Co.: vic. Crozet, 11/18/16 (11 obs: Mark Adams). Loudoun Co.: Leesburg, Ida Lee Park, 11/5/2016 (20+, fresh individuals smaller and darker above; older, larger ones worn.),), 11/13/16 (20+, one vouchered. The larger, lighter summer form individuals were all very worn. Several very fresh fall form individuals were smaller and darker overall. There is little mention of seasonal forms in literature. The changeover to the cold weather form is gradual. I'm not sure what stage they overwinter in, but I have seen them as early as March here and those are very tiny, about the size of a *Boloria bellona*). Richmond City: Maymont Park, 11/8/16 & 11/17/16 ("large numbers" reported on both dates, obs: Bill Hark). Seemingly a very good year for this species.

Boloria bellona – Albemarle Co.: vic. White Hall, 10/9/16 (1 fresh, obs: Mark Adams).

Phyciodes tharos – Loudoun Co.: Leesburg, Ida Lee Park, 11/5/2016 (1), 11/13/16 (1, mint-fresh female, net/released). Richmond City: Maymont Park, 11/17/16 (1, obs: Bill Hark).

Vanessa virginiensis – Loudoun Co.: Leesburg, Ida Lee Park, 11/5/2016 (1).

Vanessa atalanta – Loudoun Co.: Leesburg, Ida Lee Park, 11/5/2016 (1).

Junonia coenia – Albemarle Co.: vic. Crozet, 11/18/16 (4 obs: Mark Adams). Loudoun Co.: Leesburg, Ida Lee Park, 11/5/2016 (20+), 11/13/16 (1). Richmond City: Maymont Park, 11/8/16 & 11/17/16 (several on both dates, obs: Bill Hark).

Danaus plexippus – Richmond City: Maymont Park, 11/8/16 & 11/17/16 (1 each date, obs: Bill Hark).

Epargyreus clarus – Loudoun Co.: Leesburg, 10/21/16, 11/6/16, 11/7/16 (1 each day on Butterfly Bush, all unusually late for region), 11/11/16 (1 fresh female sunning itself on my deck); Leesburg, Ida Lee Park, 11/5/2016 (1, unusually late).

Pyrgus communis – Albemarle Co.: vic. Crozet, 11/18/16 (16 obs: Mark Adams). Loudoun Co.: Leesburg, Ida Lee Park, 11/5/2016 (1), 11/13/16 (3). Richmond City: Maymont Park, 11/8/16 & 11/17/16 (several on both dates, obs: Bill Hark).

Atalopedes campestris – Albemarle Co.: vic. Crozet, 11/18/16 (15 obs: Mark Adams). Loudoun Co.: Leesburg, 11/13/16 (1 observed nectaring on a common Lilac in my garden); Leesburg, Ida Lee Park, 11/5/2016 (200++; conservative estimate, swarming on flowerbeds. Largest November brood I've observed. 11/13/16 (10) & 11/18/16 (3), most were males of the small cold weather form, many very similar ventrally to *Polites peckius*.

Hylephila phyleus – Loudoun Co.: Leesburg, Ida Lee Park, 11/5/2016 (5).

Euphyes vestris – Loudoun Co.: Leesburg, 9/8/16 (1).

Panoquina ocola – Loudoun Co.: Leesburg, Ida Lee Park, 11/5/2016 (1).

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Mancos, Colorado (July, 2012)

Abilene, Texas (November, 2016)

Horticultural Gardens, Texas Tech University, Lubbock, Texas (November, 2016)

Abilene, Texas (November, 2016)

SAVE ALL SPECIES – MOTHS LIGHT A WAY?

BY

JOHN PICKERING, TORI STAPLES AND REBECCA WALCOTT

Abstract -- What would it take to save all species from extinction? A new initiative, *Save all species*, plans to answer this question and provide the tools we need to do so by 2050. Here we consider the merits and problems associated with inventorying moths to help decide which terrestrial areas to protect. We compare the scientifically-described moth fauna of the British Isles which, with 2,441 species, is taxonomically complete, with 11,806 described species from North America north of Mexico, the fauna of which is not fully described. As a percentage of the described moth fauna, there are fewer "*macro*" moths (Geometroidea, Drepanoidea, Noctuoidea, Bombycoidea, Lasiocampidae) in the British Isles (34.9%) than those known for the United States and Canada (46.1%). We present data on 1,254 species for an intensively-studied site in Clarke County, Georgia and consider whether species in the British Isles are generally smaller than ones in Georgia. We recommend using a protocol that photographs all specimens attracted to lights, as an efficient means to inventory most moth species, including small ones that are often undersampled. Much work still needs to be done on sampling methodology and across-site comparisons of moths and their host plant communities, before we might use moth inventories as an efficient means to compare floral diversity across areas.

Introduction -- Inspired by the recent book, *Half-Earth --- Our Planet's Fight for Life*, in which E.O. Wilson (2016) calls for half the planet to be devoted to preserving nature, Discover Life has started *Save all species* (see discoverlife.org/saveallspecies). This initiative is developing a 30-year plan. Its goal is to ensure that by 2050, the world has the scientific knowledge, environmental policies, protected areas, trained resource managers, technology, funding, and public support to protect them. Because the task of inventorying the world's biodiversity is huge and would take centuries at the current rate of study, the initiative plans to inventory only a dozen representative taxa that will enable us to speed the selection of enough potential parks and protected areas to save all species, including rare and locally-restricted endemics. Candidate taxa include amphibians, ants, bees, birds, bivalves, corals, fish, macro fungi, moths, and vascular plants. Here we consider moths.

Moths are an almost ideal candidate taxon for a global inventory because of several attributes. Most species are attracted to lights, and hence, are easily sampled by non-experts. They are safe. Unlike rabid bats, venomous snakes, and stinging insects, they pose no health risk. Moths are an exceedingly species-rich group, for which the diversity at a terrestrial site will typically exceed any other taxon except for beetles. Because moth larvae are restricted in their diet to specific host taxa, differences in the assemblages of resident moth species could reflect differences across sites in plants and other hosts. If that's true, we may be able to use moth inventories as efficient proxies to compare surrounding plant communities.

Inventorying moths presents challenges, notably, sampling smaller species, describing thousands of species new to science, and identifying specimens accurately. Our experience is that we can identify 99% of moths from digital images to species, species-groups, which contain species of similar appearance, or morphospecies, in the case of undescribed species. Thus, digital photography now empowers non-experts to inventory and monitor sites with verifiable data on their sightings. Online identification tools and human experts can then help in specimen identification via the Internet.

This is the fifth article in the SLN that concerns Discover Life's *Mothing* project, which since 2010 has taken over 625,000 photographs to inventory 3,000 species at 25 sites in North America and Costa Rica (see discoverlife.org/moth). Pickering (2015) gives an overview of the project and invites SLS members to join. Pickering (2016) considers factors that affect seasonal flight activity. Pickering and Staples (2016) describe how to inventory moths efficiently by sampling around new moons. And Pickering et al. (2016) compare moth diversity and taxonomy between Africa and North America north of Mexico. Here we extend our analysis to include data from the British Isles and focus on differences across samples in the percentage of "*macro*" moths (Geometroidea, Drepanoidea, Noctuoidea, Bombycoidea, Lasiocampidae) to "*other*" moths (notably the species-rich Pyraloidea, Tortricidae, Gelechioidea, and Gracillarioidea). [Note that this definition of *macro* moths differs from the one used in Britain, which also includes Cossoidea and some other large moths.]

Along with other parts of Europe, the biota of the British Isles is amongst the best studied in the world. Its Lepidoptera are scientifically described and there is a wealth of data documenting the distribution, phenology, food plants, and abundance of most species, in part because of considerable contributions from amateur naturalists. Highlights from these include an online

checklist to 2,441 moths and 83 butterflies by Agassiz et al. (2015) and Butterfly Conservation's *Moths Count* (www.mothscount.org) which runs a national moth recording scheme to collect data on over 900 of the larger species. Through partnerships, including with the Garden Moth Schema (www.gardenmoths.org.uk), which now monitors approximately 200 species with weekly trapping through the flight season at 350 sites, *Moths Count* has assembled over 20 million current and historical sightings since its launch in 2007. With Rothamsted Research (www.rothamsted.ac.uk), which has coordinated a national network of light-traps at a total of over 430 sites since 1968, they produced *The State of Britain's Larger Moths* (Butterfly Conservation and Rothamsted Research, 2013), that documents the decline in many common and widespread species, the possible causes of which include habitat loss and are reviewed by Fox (2013). In addition, the British Isles has a slew of websites rich in information on their Lepidoptera. These include UK moths (www.ukmoths.org.uk), UK Butterflies (www.ukbutterflies.co.uk), UK Lepidoptera (www.ukleps.co.uk), Moths Ireland (www.mothsireland.com), and regional websites, such as for Berkshire (sites.google.com/site/berksmoths), Devon (devonmoths.org.uk), Essex (www.essexfieldclub.org.uk), Gloucestershire (www.gloucestershire-butterflies.org.uk), Hampshire (http://www.hantsmoths.org.uk), Huntingdonshire (http://www.hmbg.org), Lancashire (www.lancashiremoths.co.uk), Norfolk (www.norfolkmoths.co.uk), Northamptonshire (www.northamptonshirewildlife.co.uk), Northumberland (www.northumberlandmoths.org.uk), and Suffolk (www.suffolkmothgroup.org.uk), and speciality websites, such as sites on leaf mines (www.ukflymines.co.uk) and genitalia (mothballs?) (mothdissection.co.uk).

Here we compare the moth faunas of the British Isles and North America north of Mexico. Our goal is to examine how best to inventory moths *per se*, as a methodology, rather than to understand fundamental biological differences across the faunas presented. Thus, we leave a discussion of Bergmann's rule and its converse, which concern the size of specimens as a function of latitude (Chown and Gaston, 2010; Kivela et. al, 2011), to a future paper in which we will include measurements of wing lengths.

Our primary concern is to contend with the taxonomic and sampling biases that favor the better documentation of larger species over smaller ones. We do this by including a comparison of higher taxa within regional checklists for Gloucestershire and Northumberland within England, for Georgia and North Carolina within the United States, and for Discover Life's intensively-studied Blue Heron site in Clarke County, Georgia.

Methods & Results

British Isles

Table 1 summarizes the moth fauna by higher taxa for the British Isles (in pink) and North America north of Mexico (in green). It follows the phylogeny listed at discoverlife.org/moth/highertaxa.txt which is based on the Lepidoptera of the Tree of Life web project (tolweb.org), as per pickering et al. (2016). It gives the total

Table 1	British Isles	%	Glouces-tershire	%	Northum-berland	%	Glouc. & Northum.	%	North America	%	Georgia	%	North Carolina	%	Georgia & NC	%	Blue Heron	%
Total	2,441		1,590		1,297		1,131		11,806		2,783		2,755		2,266		1,254	
MACRO MOTHS	853	**34.9**	584	**36.7**	522	**40.2**	469	**41.5**	5,448	**46.1**	1,417	**50.9**	1,399	**50.8**	1,239	**54.7**	577	**46.0**
Geometroidea	307	12.6	235	14.8	203	15.7	188	16.6	1,448	12.3	317	11.4	325	11.8	279	12.3	132	10.5
Noctuoidea	498	20.4	309	19.4	285	22.0	249	22.0	3,718	31.5	1,001	36.0	987	35.8	876	38.7	403	32.1
Arctiinae	32	1.3	20	1.3	12	0.9	12	1.1	298	2.5	72	2.6	76	2.8	62	2.7	27	2.2
Bombycoidea	20	0.8	17	1.1	15	1.2	13	1.1	225	1.9	83	3.0	71	2.6	70	3.1	30	2.4
Saturniidae	1	0.0	1	0.1	1	0.1	1	0.1	87	0.7	23	0.8	20	0.7	20	0.9	11	0.9
Sphingidae	18	0.7	16	1.0	14	1.1	12	1.1	133	1.1	57	2.0	49	1.8	48	2.1	17	1.4
Lasiocampidae	12	0.5	8	0.5	6	0.5	6	0.5	36	0.3	9	0.3	9	0.3	8	0.4	7	0.6
OTHER MOTHS	1,588	**65.1**	1,006	**63.3**	775	**59.8**	662	**58.5**	6,358	**53.9**	1,366	**49.1**	1,356	**49.2**	1,027	**45.3**	677	**54.0**
Pyraloidea	199	8.2	113	7.1	96	7.4	84	7.4	1,538	13.0	425	15.3	408	14.8	335	14.8	214	17.1
Tortricidae	383	15.7	264	16.6	216	16.7	184	16.3	1,319	11.2	295	10.6	360	13.1	227	10.0	178	14.2
Zygaenoidea	12	0.5	5	0.3	2	0.2	2	0.2	101	0.9	42	1.5	33	1.2	33	1.5	27	2.2
Pterophoridae	46	1.9	23	1.4	16	1.2	13	1.1	161	1.4	34	1.2	28	1.0	23	1.0	8	0.6
Sesioidea	16	0.7	10	0.6	2	0.2	2	0.2	130	1.1	47	1.7	42	1.5	40	1.8	4	0.3
Cossoidea	3	0.1	2	0.1	1	0.1	1	0.1	48	0.4	6	0.2	6	0.2	6	0.3	5	0.4
Gelechioidea	468	19.2	254	16.0	184	14.2	147	13.0	1,808	15.3	306	11.0	239	8.7	201	8.9	130	10.4
Yponomeutoidea	102	4.2	73	4.6	70	5.4	59	5.2	241	2.0	29	1.0	31	1.1	21	0.9	12	1.0
Gracillarioidea	111	4.5	87	5.5	69	5.3	63	5.6	413	3.5	50	1.8	82	3.0	39	1.7	26	2.1
Tineoidea	70	2.9	35	2.2	23	1.8	16	1.4	218	1.8	75	2.7	65	2.4	60	2.6	55	4.4
Nepticulidae	100	4.1	75	4.7	52	4.0	47	4.2	96	0.8	15	0.5	19	0.7	12	0.5	3	0.2

Table 1. British and North American moth species tabulated by higher taxa.

numbers for each location at the top in bold and the percentage of this total for each taxon to the right. It puts in bold the percentage for the subtotals of *macro* and *other* moths. Thus, there are 2,441 species for the British Isles of which 34.9% are *macro* moths. We extracted these species from Agassiz et al. (2015) and tabulated them, excluding 83 butterflies. Except for some accidentals and other exceptions, this checklist includes all the Lepidoptera in the British Isles.

North America north of Mexico

Table 1 presents a total of 11,806 moths for North America, of which 46.1% are *macro* moths. These species are in Discover Life's identification guide and checklist of North America north of Mexico (Pickering, 2010). This list excludes the names of unpublished morphospecies and for which Discover Life's database did not include an occurrence record on the continent north of Mexico. Pickering (2015) and Pickering et al. (2016) give details on how we assembled these names and attempt to keep them current.

Taxonomic descriptions by year

Figure 1 graphs the species in these two columns as a function of the year when taxonomists described them, starting with Linnaeus in 1758. It presents the accumulative number of *macro* and *other* moths for the British Isles (labelled UK) and the curves for Geometroidea, Noctuoidea, Bombycoidea, and *other* moths for North America (labelled NA). By 1860, the British fauna was effectively described. In contrast, species in North America are still being described. Pickering et al. (2016) presents curves for additional North American higher taxa, comparing them to accumulative curves for African regions.

It is unclear whether the moth fauna of the British Isles has generally smaller moths than North America, as the respective values of 34.9% to 46.1% *macro* moths in Table 1 might suggest, or whether the value of 46.1% for North America is inflated because of a tendency by taxonomists to describe large species before small ones, as Figure 1 might suggest.

Gloucestershire versus Northumberland

To show the potential bias in inventorying *macro* versus *other* moths, which are generally smaller, we tabulated the moths of Gloucestershire (1,590 species, 36.7% *macro* moths) and Northumberland (1,297 species, 40.2%). These species are those in Agassiz et al. (2015) and listed on the respective county websites given above. Both of these counties have a higher percentage of *macro* moths in their checklists than the 34.9% value for the entire British Isles. Furthermore, we tabulated the species listed for both counties and present them in the column labelled 'Glouc. & Northumb.', which has a total of 1,311 overlapping species, of which an even higher percentage (41.5%) are *macro* moths. We could interpret these results as indicative of the counties over sampling *macro* species relative to smaller *other* moths. Alternatively, smaller moths may have more restricted distributions than *macros* and are simply not sampled because they are not at sampling sites.

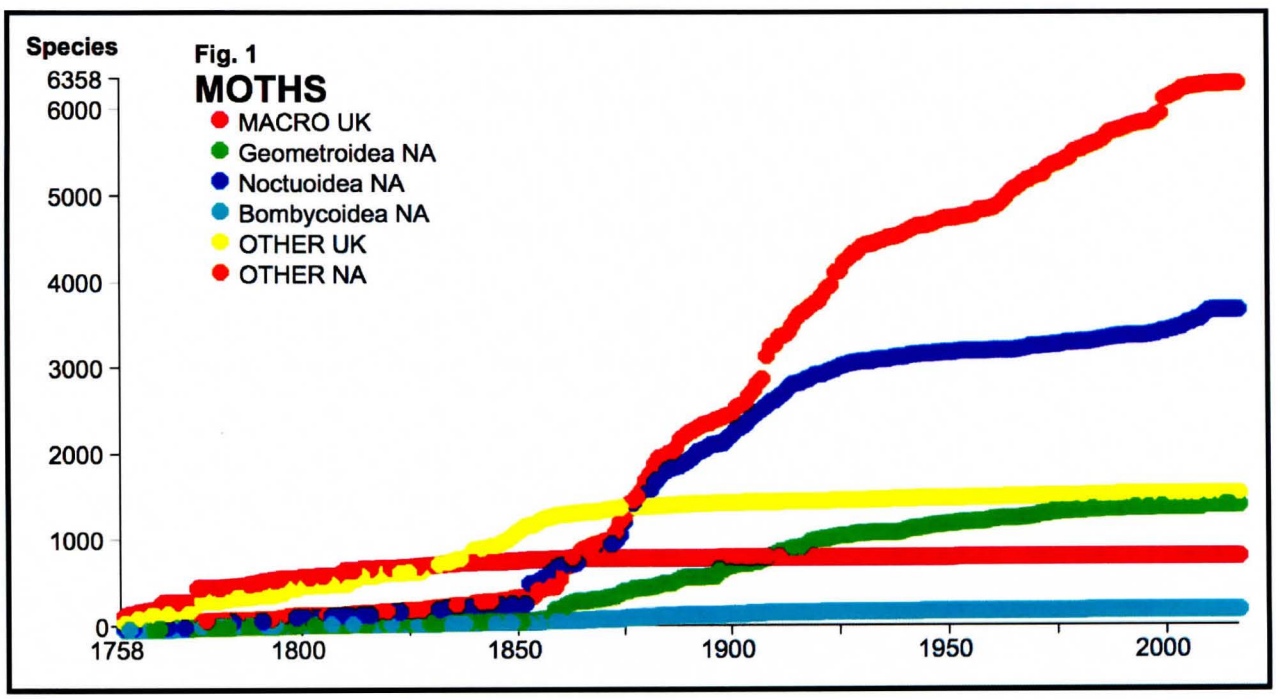

Fig. 1. Accumulation of species by year of scientific description for moths of the British Isles (UK) and North America north of Mexico (NA). MACRO are species in Geometroidea, Drepanoidea, Noctuoidea, Bombycoidea and Lasiocampidae. OTHER are those in all other Lepidoptera taxa excluding butterflies.

U.S. states

Using Discover Life's state checklists, which are compiled from numerous sources, including Moth Photographers' Group (mothphotographersgroup.ms state.edu), we tabulated the number of described species and percentage *macro* moths for 23 selected states with the following results: Alabama (1,432, 47.7%), Arizona (855, 55.0%), California (4,217, 50.3%), Colorado (1,722, 70.0%), Florida (2,809, 45.1%), Georgia (2,783, 50.9%), Illinois (2,032, 43.0%), Louisiana (1,474, 67.9%), Maryland (2,286, 50.3%), Massachusetts (1,714, 61%), Michigan (2,021, 56.5%), Mississippi (1,256, 37.8%), New York (1,468, 61.4%), North Carolina (2,755, 50.8%), Ohio (2,468, 46.8%), Oregon (1,097, 76.1%), Pennsylvania (2,122, 52,2%), South Carolina (1,962, 52.4%), Tennessee (2,300, 50.3%), Texas (2,799, 57.9%), Virginia (918, 58.7%), Washington (1,392, 63.6%) and Wisconsin (1,543, 67.6%). Only three of these states, Florida, Illinois and Mississippi, have a lower percentage of *macros* than the value of 46.1% for North America as a whole. Again, these data suggest that either macro moths are more likely to be included in a checklist, that smaller moths are more regional, or possibly both. As a caution we note that these checklists are incomplete. Alabama is grossly undersampled, for example. Its current checklist has about half the species of neighboring Georgia.

Georgia versus North Carolina

To compare two U.S. states in a similar way as for the two English counties, Table 1 shows the checklists for Georgia and North Carolina by higher taxa. It also presents the 2,266 species (54.7% *macro* moths) that are recorded from both Georgia and North Carolina (labelled 'Georgia & NC'). These results are similar to the English ones. For whatever reason, there are a higher percentage of *macro* moths in these state checklists and more so in the species that are reported as in both.

We note that the British Isles (315,160 sq. km) are a bit more than twice the size of Georgia (153,910 sq. km) and North Carolina (139,390 sq. km). Gloucestershire (3,149 sq. km) is 10 times, and Northumberland (5,014 sq. km) 16 times the area of Clarke County (313 sq. km), the smallest county in Georgia. We forego bragging here about how moth diversity and favorable climate may be linked.

Blue Heron

The final column in Table 1, labelled 'Blue Heron', lists the higher taxa of 1,254 moth species (46% *macro* moths) that we photographed at Discover Life's intensively-studied site in Clarke County, Georgia (latitude 33.8882°N, longitude 83.2973°W), during nightly sampling over five years, 2011-2015. Pickering (2015, 2016) and Pickering and Staples (2016) provide details on the site and our methodology. The Blue Heron values in Table 1 include 91 morphospecies, one *macro* moth, an undescribed *Papaipema* (Noctuidae, *sp_new_species_3*) and 90 *other* morphospecies as follows: Acrolophidae (4), Blastobasidae (4), Bucculatricidae (1), Coleophoridae (1), Cosmopterigidae (2), Crambidae (2), Gelechiidae (21), Gracillariidae (6), Lyonetiidae (1), Micropterigidae (1), Nepticulidae (2), Oecophoridae (1), Opostegidae (1), Pyralidae (9), Symmocidae (2), Tineidae (7), Tischeriidae (1), Tortricidae (24). These morphospecies are ones that we cannot identify to a described species and may be new to science. For databasing and analysis we name each morphospecies with a binomial that includes the string '*sp_*'. Detailed information on all species with specimen photographs, abundance, and seasonal phenology is online. For the Blue Heron species in Table 1 see www.discoverlife.org/moth/data/table 2_33.9_-83.3.html.

Since inception in 2010, Discover Life's team has taken 216,000 photographs at the Blue Heron site and identified 162,400 of its Lepidoptera into 1,293 species, species-groups, and morphospecies. Table 1 only tabulates those photographed for 2011-2015. Our sampling for 2010 and identification for 2016 are incomplete. The Blue Heron site provides the most complete moth dataset for North America of which we are aware. Because we attempted to photograph all moths, both *macro* and *other*, every night over the five years, and have identified over 99% of the specimens to species, there is reduced bias in favor of *macro* moths compared with most studies that use light-traps.

If we assume that there is no bias in favor of sampling *macro* versus *other* species in the Blue Heron data, then we can assert that the size of moth species at the site are larger on average than those in the fauna of the British Isles, based on the respective 46.0% to 34.9% *macro* moth values. Such an assertion would be the converse of Bergmann's rule. However, because the data from Blue Heron are only based on specimens attracted to lights and not on reared material and other collecting methods used in the description of the British fauna, we caution about using the data in that way. Clearly, it would be far better to use the same methods to compare across faunas.

Temporal bias favors sampling *macro* moths

A further complication that may favor the sampling of *macro* moths concerns flight activity based on size. At the Blue Heron site, we found that *macro* moths were present more nights than *other* species. Of all 1,254 species recorded in 2011-2015, 46.0% are *macro* moths. This percentage increases to 46.4% when we exclude the 171 species recorded on a single night and to 48.3% when we also exclude the 95 species recorded on only

two nights. When we exclude species present for under 9 nights, it is 51.1%; under 17, 54.1%; under 33, 57.3%, and under 65, 62.8%. The percentage is 80.0% when only the five species sampled on the most nights remain, a crambid, *Microcrambus elegans*, and four geometrids. Multiple factors may explain this trend in the data, including the possibilities that (1) smaller species may be more likely to be vagrants that are rarely sampled, (2) smaller species may have shorter seasonal flight periods, (3) smaller species may be more thermally challenged and not fly on colder nights, and (4) smaller moths may not respond to lights as much or from as far as larger species.

Discussion

One of our goals is to understand the many factors that influence the sampling of moth species at lights. How do the different methods that we use affect our understanding of moth diversity, abundance, and phenology over time and across distance? Clearly, as suggested by the percentage of *macro* to *other* moths in the data presented, size is a key factor that we should consider. Much current information on the occurrence of smaller species is biased for a number of reasons. Relative to *macro* moths, smaller species are under-described by taxonomists, they are under-sampled by most research protocols, and they are harder to identify, in part, because the tools and expertise to do so is lagging behind what is available for *macro* moths. As a consequence, they are underrepresented in databases and checklists.

The biology and natural history of smaller moths may be such that their flight activity is more restricted in both time and space. If smaller species are more restricted to particular host plants, or if they fly shorter distances to lights, then they may better reflect local host plant communities than *macro* moths. They may be the species that we need to study to better document and understand local differences in biodiversity. Hopefully, with the help of better resources, such as the *Field Guide to Micro Moths of Great Britain and Ireland* (Sterling and Parsons, 2012), naturalists will be inspired to work more with them and answer the questions posed.

For the purposes of *Save all species,* Discover Life plans to expand its *Mothing* project and improve how we inventory moths around the world. At the last SLS meeting in October and since, we have recruited five individuals to help us. This paper was inspired by Julie Doherty, who works at the Avon Wildlife Trust in England. She will help us integrate our efforts with British naturalists and their research and conservation projects. Vijay Barve and Joe Martinez at the University of Florida will help us with Indian and Mexican moths, respectively. Ron Parry has contributed photographs of 330 species from sites in New Mexico and Texas. And, Frank DiStephano has uploaded 7,700 images of moths in Pennsylvania and Costa Rica. We invite others to join us too.

Conclusions

To keep it fun, we end with a poem.

On moth lights

Ask away,
a way?
Let's
answer
a way
or
away
before
we say
aweigh.

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Acknowledgments -- We thank Justin Long for technical support. We thank Jerry Cook, Julie Doherty, John Douglass, Steve French, William Godwin, Dave Grundy, Barry Lombardini, Albert Meier, Tomas Pickering, Malcolm Storey and Brian Wiegmann for help in developing and reviewing this article.

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