



# Southern Lepidopterists' NEWS

EST. 1978

Official Newsletter of the Southern Lepidopterists' Society

Vol. 29 NO. 2

June 30, 2007

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/](http://www.southernlepsoc.org/))

J. BARRY LOMBARDINI: EDITOR

*PHOEBIS SENNAE EUBALE* LINNAEUS IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

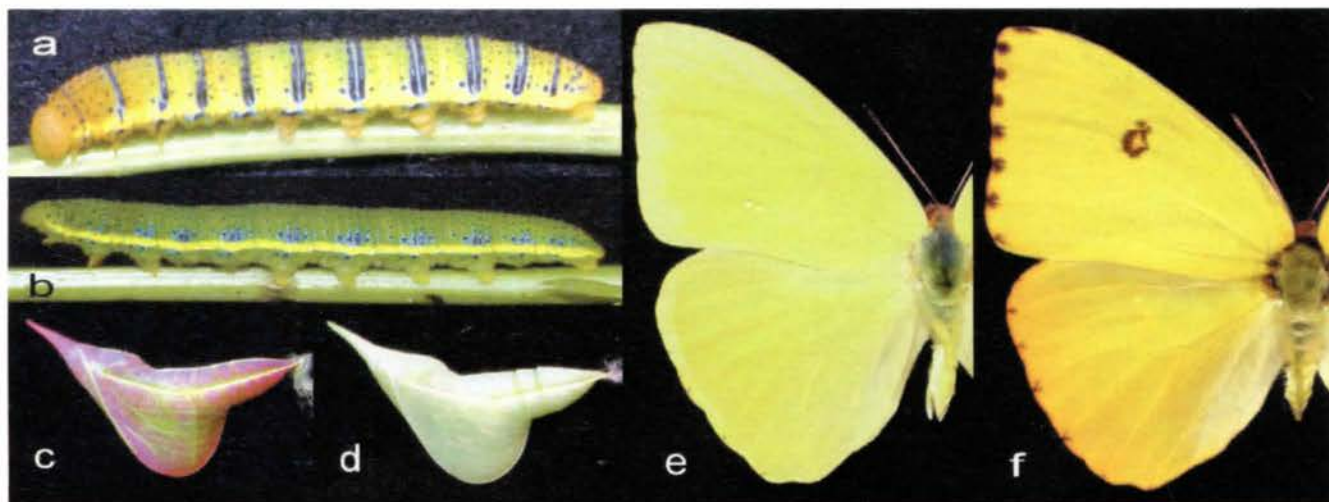


Fig. 1. *Phoebis sennae eubale*: a. yellow form late instar larva, b. green form late instar larva, c. pink pupa, d. green pupa, e. male adult, f. female adult.

Adults of the common bright yellow butterfly *Phoebis sennae eubale* (Linnaeus) (Fig.1) are common year-round in Louisiana. The adults are fast fliers and difficult to capture on the wing. Their erratic and zigzag flight may account for the majority of specimens having some sort of wing or scale damage when captured. This year, I located a few patches of the roadside plant *Cassia obtusifolia* L. (Fig. 2) which occurs in 26 states, mostly eastern United States and California, Puerto Rico and the Virgin Islands. This species is also known commonly as "sickle pod" due to the elongated sickle-shaped seed pod. This species is listed as an annual & perennial in the family *Fabaceae*. *Cassia*



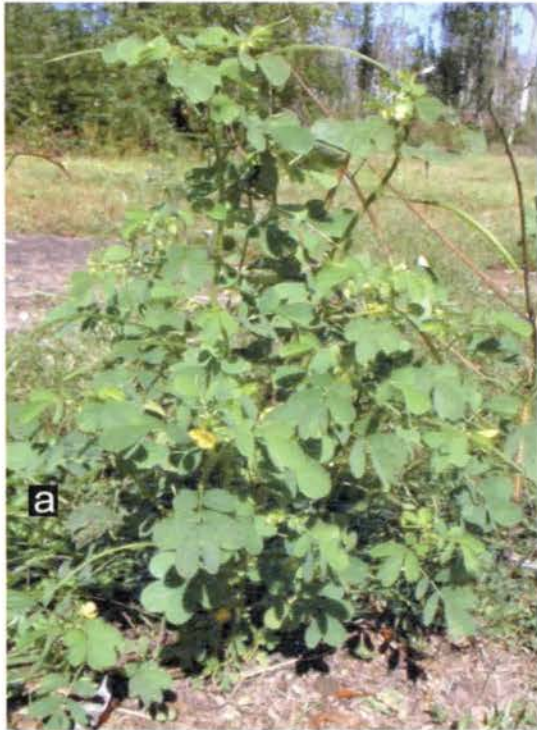


Fig. 2. *Cassia obtusifolia* L. in Louisiana.

has been replaced by the genus *Sennae* by some authors and there are perhaps 650 species of *Cassia* (*Sennae*) worldwide, small plants to huge trees.

Howe (1975) states in Louisiana, the principle food plant of *eubale* is Partridge pea (*Chamaecrista cinerea*), though I have never seen this plant. Many species of *Cassia* are commonly called "partridge pea".

I was able to find dozens of larvae of *eubale* and *Eurema nicippe* (Cramer) in searching *obtusifolia* plants and removed and replanted several hundred of these plants to my home to further rear the larvae. After establishing the plants in their new environment, the adults of *eubale* and *nicippe* continued to oviposit on these plants daily, sometimes by the dozens continually all day long beginning with the presence of bright sunshine and continuing to near dusk. The larvae appear to have two color forms, yellow and green (Fig. 1a,b), pupae have three color forms (Fig. 1c,d): green, yellow and pink. Adult males have immaculate bright yellow uppersides, on all wing edges a noticeable paler shade. The undersides of males (Fig. 3a) have little maculation. Adult females above are marked with black spots at the wing margins and can be the same shade of yellow on both upper and

lowerside or with an orange hue throughout. Female undersides have more maculation (Fig. 3b). Howe (1975) reports *eubale* to occur in the southeastern United States, having continuous broods in the Gulf region and Florida.

*P. s. eubale* can be found over the entire southeast United States and occasional specimens north to Canada. This is a well known migratory species which passes through Louisiana in huge numbers of specimens in the fall months and a much smaller number returning in the spring.

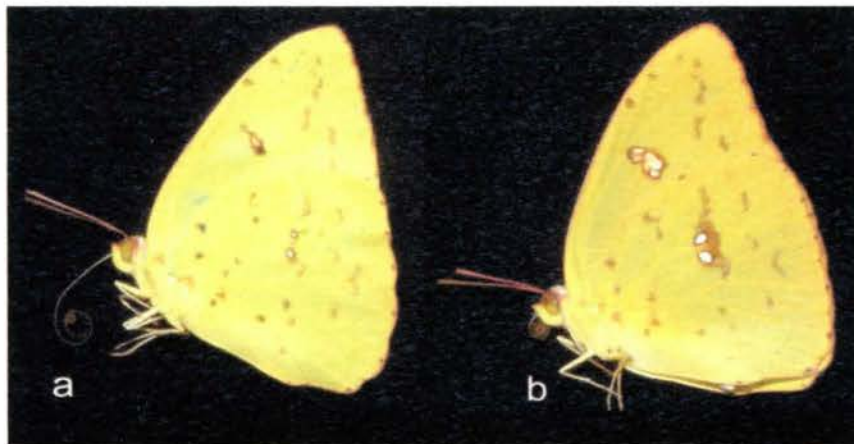


Fig. 3. *Phoebe sennae eubale* undersides: a. male, b. female.



Fig. 4. All known parish records for *P. s. eubale*.

*P. s. eubale* was previously reported in Louisiana by von Reizenstein (1863) and subsequently by Montgomery (1932), Jung (1939, 1950), Lambremont (1954), Ross and Lambremont (1963), and Brou (1974) who reported a single specimen captured at light from St. John the Baptist Parish. Klots (1951) reports that *Phoebe sennae sennae* Linnaeus appearing specimens occur in Louisiana and southern Florida. I have captured many hundreds of *eubale* in all months of the year across the state, including at least 20 specimens in ultraviolet light traps at the Abita Springs study site. The parish records for *eubale* are illustrated in Fig. 4.

#### Literature Cited

- Brou, Vernon A. 1974. Butterflies taken in light traps. *Jour. Lepid. Soc.* 28:331.  
 Howe, W. H. 1975. *The Butterflies of North America*. New York, Doubleday & Company, Inc. 633 pp. 97 plates.

- Jung, R. C. 1939. On the occurrence of some of southern Louisiana's more common butterflies. *Tulane Biol.* 3:17-18.  
 Jung, R.C. 1950. An annotated list of the Lepidoptera of the New Orleans area. *Proc. Louisiana Acad. Sci.* 13: 46-47.  
 Klots, A.B. 1951. *A Field Guide to the Butterflies of North America East of the Great Plains*. Boston: Houghton Mifflin. 349 pp. 40 pl.  
 Lambremont, E. N. 1954. The butterflies and skippers of Louisiana. *Tulane Studies Zool.* 1:125-164.  
 Montgomery, Robert W. 1932. Records of Louisiana Butterflies. *Ent. News* 43:182.  
 Ross, G.N. & E.L. Lambremont 1963. An Annotated Supplement to the State List of Louisiana Butterflies and Skippers. *Jour. Lepid. Soc.* 17:148-158.  
 von Reizenstein, L. 1863. *Catalogue of the Lepidoptera of New Orleans and its vicinity*. Isaac T. Hinton. New Orleans, 8pp.

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

\*\*\*\*\*

## ERRATA NOTICE

### "LEPIDOPTERA OF FLORIDA"

Plate 32 should have the following corrections made on the plate to correspond to the captions:

Plate number 2 should be caption Fig. 3

No. 3 should be Fig. 4

No. 4 should be Fig. 5

No. 5 should be Fig. 2

Fig. 6-9 are correct as the caption states. The numbers were inadvertently wrongly sequenced to the final plate by our artist and the errors escaped detection until now.

Dr. J. B. Heppner

Curator of Lepidoptera Florida State Collection of Arthropods, DPI, FDACS

P. O. Box 147100

Gainesville, FL 32614-7100

DPI: (352) 372-3505 x139; Fax: (352) 334-0737

McGuire Center: (352) 846-2000 x243

E-Mail: [heppnej@doacs.state.fl.us](mailto:heppnej@doacs.state.fl.us)

\*\*\*\*\*

## A GREAT TAUNT AND INSULT FROM A WELL-KNOWN HISTORICAL FIGURE

*"I have never killed a man, but I have read many obituaries with great pleasure."*

Clarence Seward Darrow (April 18, 1857 - March 13, 1938) was an American lawyer and leading member of the American Civil Liberties Union, best known for defending teenaged thrill killers Leopold and Loeb in their trial for murdering 14-year-old Bobby Franks (1924) and defending John T. Scopes in the so-called "Monkey" Trial (1925), in which he opposed the famous prosecutor William Jennings Bryan. He remains notable for his wit, compassion, and agnosticism that marked him as one of the most famous American lawyers and civil libertarians of his time. [From Wikipedia, the free encyclopedia]

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*



### The Southern Lepidopterists' Society

#### OFFICERS

Marc Minno: Chairman  
2433 River Tree Circle  
Sanford, FL 32771  
E-Mail: [bblmont@masseyservices.com](mailto:bblmont@masseyservices.com)

Jeffrey R. Slotten: Treasurer  
5421 NW 69th Lane  
Gainesville, FL 32653  
E-Mail: [jslotten@bellsouth.net](mailto:jslotten@bellsouth.net)

Donald M. Stillwaugh: Secretary  
604 Summerhill Ct Apt. D  
Safety Harbor, FL 34695-4387  
E-Mail: [dstillwa@co.pinellas.fl.us](mailto:dstillwa@co.pinellas.fl.us)

Paul Milner: Membership Coordinator  
272 Skye Drive  
Pisgah Forest, NC 28768  
E-Mail: [pamilner@citcom.net](mailto:pamilner@citcom.net)

Tom Neal: Member-at-Large  
1705 NW 23<sup>rd</sup> Street  
Gainesville, FL 32605  
E-Mail: [Chouwah@aol.com](mailto:Chouwah@aol.com)

Dave Morgan: Website Manager  
4935 Shadowood Parkway  
Atlanta, GA 330339  
E-Mail: [davemor@us.ibm.com](mailto:davemor@us.ibm.com)

J. Barry Lombardini: Editor  
3507 41st Street  
Lubbock, Texas 79413  
E-Mail: [jbarry.lombardini@ttuhsc.edu](mailto:jbarry.lombardini@ttuhsc.edu)

The Southern Lepidopterists' Society is open to anyone with an interest in the Lepidoptera of the southern region of the United States. Annual membership dues:

Regular	\$20.00
Student	\$15.00
Sustaining	\$30.00
Contributor	\$50.00
Benefactor	\$70.00

A newsletter, The News of the Southern Lepidopterists' Society is published four times annually.

Information about the Society may be obtained from the Membership Coordinator or the Society Website: [www.southernlepsoc.org/](http://www.southernlepsoc.org/)

## INDEX

	Page
1. <i>Phoebis sennae eubale</i> Linnaeus in Louisiana by Vernon A. Brou Jr.....	33
2. Errata Notice.....	35
3. A Great Taunt and Insult from a Well-Known Historical figure.....	35
4. The Dangers of Lepping by James K. Adams.....	37
5. Strong Return of the <i>Fulvia</i> Checkerspot [ <i>Chlosyne fulvia fulvia</i> (W.H. Edwards)].....	39
6. Logical Fallacies.....	40
7. Letter to the Editor by Lawrence Hribar.....	42
8. New Data on Miocene Butterflies in Dominican Amber (Lepidoptera: Riodinidae and Nymphalidae) with the Description of a New Nymphalid By Enrique Peñalver and David A. Grimaldi.....	44
9. New Host Plant Record for <i>Euphyes berryi</i> by David Fine.....	60
10. Reports of State Coordinators.....	65
11. <i>Catocala miranda</i> Hy. Edwards 1881 in Louisiana by Vernon A. Brou Jr.....	66
12. Spotlight on Rearing <i>Automeris io lilith</i> (Strecker) by Vernon A. Brou Jr.....	71
13. <i>Portentomorpha Xanthialis</i> (Gn.) in Louisiana by Vernon A. Brou Jr.....	72

\*\*\*\*\*

**DEFINITIONS** - *Apiculus* (pl. *apiculi*) - a small acute point or tip. Skippers (Hesperiidae) have a clubbed antenna ending in a curved tip referred to as the *apiculus*.

**Cremaster** - The *cremaster* is a spiny appendage which appears at the bottom of the pupal abdomen. Most butterfly pupae are attached to a surface by a silken pad spun by the caterpillar and a set of hooks, called the *cremaster*, at the tip of the pupal abdomen.

**Girdle** - A strand of silk used to prop up the pupa. This structure, the *girdle*, is found primarily in the Papilionidae.

**Relict** - this term is used to refer to surviving remnants of natural phenomena. In biology a relict is an organism that at an earlier time was abundant in a large area but now occurs at only one or a few small areas. The term *relict* can also refer to an ancient species that survives while related species go extinct. The horseshoe crab is such an example of this type of *relict*. The ancient species in this example would be the eurypterids which disappeared in the Permian-Triassic extinction event. [Also an archaic term for a widow or widower who survived the death of their spouse.]

Source: <http://en.wikipedia.org/wiki/Relict>

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

\*\*\*

## THE DANGERS OF LEPPING

BY

JAMES K. ADAMS

As many of you are aware, our marvelous editor is always looking for material, so when he recently asked me to generate an article for the newsletter I decided to generate something on the "*Dangers of Lepping*." This topic was recently a thread on more than one of the Lepidoptera listserves, and, after some meager resistance, I couldn't help but be drawn into the conversation. I felt that this material would probably make for an entertaining article, and I am also hoping, as I suggested with my "*First Encounters*" article a couple of years ago, that more of you will be inspired and share your "*Dangers of Lepping*" experiences with us in upcoming issues of the newsletter.

The most obvious danger of lepping, one that must be taken seriously, is the two-legged predatory danger. Our passion often takes us off the beaten path and puts us in rather precarious circumstances as far as other people are concerned. I am completely aware that some of us have had some none too pleasant experiences with other people on the face of our planet. Thankfully, in my travels, I've only had a couple of "iffy" encounters, and, in general, the people I have encountered have been wonderful and simply added to the fond memories of the lepping experience. Still, I feel for those of you for whom this has not always been the case.

That said, I have been remarkably lucky as far as encounters with other "dangerous" animals is concerned. I have undoubtedly stepped around a LOT of poisonous snakes in my time in the tropics, semi-arid desert, and even in the pine forests near where I live, but have rarely seen any. I can count the total number of poisonous

snake encounters of which I have been aware easily on two hands. The most recent poisonous snake encounter I had involved a nice looking small snake in south Florida that my mom pointed out to me. It didn't look like any poisonous snake I knew, so I put my net rim down over the middle of the snake, grabbed the tail, at which point it reared its head up and opened its mouth . . . to reveal a very white mouth lining. It's a good thing that butterfly nets make excellent snake screens (and even snake bags should you ever want to catch one). And I learned that day that the appearance of young Cottonmouths is quite a bit different from adults!

As for large predatory mammals, I had one bobcat encounter, that really can't be called an encounter since the rabbit it was chasing ran by me first followed by the bobcat who seemed to take little notice of me. I had an encounter with an ocelot in S. Texas almost three decades ago, but that was a brief pause in the middle of a trail as we looked at one another before it sprang off into the underbrush. Another encounter with a jaguarundi in Costa Rica, again where we just looked at each other, completes the set of big cat encounters I've had.

I'm betting that many of you would probably agree that some domesticated animals are more dangerous than the wild ones. Certainly, there are several lepidopterists (though not me) who have had VERY unpleasant encounters with dogs. I did have a "cow" encounter in some semi-wilderness in southern Colorado that was momentarily unpleasant -- a "stand-off" where I was getting less and less sure of myself as the cow

looked less and less like it was going to back down, until my mom, all five-foot four of her, picked up a stick, waved it back and forth and started yelling something like "C'mon, move along now!" and of course the cow did just that.

Certainly the most unpleasant animal encounters I've had have been with other insects. I've been stung innumerable times, including in the lip, eyelid, nipple, up both legs of a pair of shorts in the same encounter, and many other places. This, of course, is an ever present "*Danger of Lepping*". I have two other insect encounters that deserve special mention. I once had a "*nasty-chemical*" secreting beetle fly into my eye, resulting in blisters on the inside of my eyelid which made it excruciating to move my eyelid up and down on the surface of my eye. I had to go to the ophthalmologist who peeled my upper eyelid up and scraped off the offending pustules (after applying deadening/disinfecting chemicals to the eye, of course!). There was another time in Mexico where I discovered a group of apparently spine free limacodid (slug) caterpillars (most have deciduous spines that have irritating chemicals associated with them). Not long after handling them a little bit, I had an itch inside my nose. I scratched it. Then scratched it many more times over the next couple of hours as I dealt with the horrible burning from the very fine spines that I had introduced into my nose. Good thing I'm not bothered too much by grossing out other people, because I had my finger up my nose for most of the following two hours. For anyone who has ever reared any spiny larvae, I am certain that you can relate to this experience, although perhaps not quite this

particular experience!

In the end, however, it has been the PLANTS that have turned out to be the most dangerous in my experience. I have three encounters that REALLY stand out, but there have been plenty of other spined and irritating chemical-laden plants that have made my life uncomfortable for a while. I remember the first time I chased western orange tips in the Arizona desert. It was a great early March day. There was one specific orange tip that I was running after, and I was doing a fine job of dodging all of the cacti as I got closer. However, I don't know how many of you have ever experienced the "tunnel vision" phenomenon, where, as you get closer to the creature you are chasing, your perceived vision narrows, eliminating a lot of the peripheral abilities. This happened with this orange tip. Three, two, one step away, and the only thing I remember seeing as I swung was the orange tip. Too bad for my left knee. I proceeded to quickly place the net down on the ground as my attention focused on the jumping cholla branch attaching my jeans to my knee. Thank goodness I had long pants on, or the glochids (those tiny spines that get everywhere but you can barely see) would have been horrible for many days to come. I had to pry the branch off of my knee with my net pole, as this cactus is almost solid thorns. In turn, it took a LOT of effort to pull the barbed thorns of this cactus out of my pants and knee, and I had to remove a couple with pliers after removing my jeans. Thankfully, no splinters were left behind, though a couple of the holes in my skin were pretty big!

Once in Mexico, I was on a rocky slope looking down at the top of leps swarming around a blooming bush, and, as I stepped down the slope, I proceeded to stumble and then fall. Not a long distance, and I was basically unhurt, except for a short

stout spine on a vine that had embedded itself shallowly in my right forearm just above the wrist. There wasn't much pain, and I simply removed the spine and went on. The rest of the day was very pleasant, lep-filled, but otherwise uneventful. I went to bed that night with a mild soreness in my right forearm, but no big deal. Wrong. I woke up the next morning with a club for a right forearm, swollen a third again beyond normal diameter. Still, there wasn't much pain, but it was hard for me to bend my wrist or elbow, and there was the creeping feeling of swelling continuing on up my arm. For a while I was quite concerned about some sort of systemic reaction, but thankfully by the afternoon the swelling went down.

Another time in Mexico, I was walking up a muddy hillside. As I started to slip, in my peripheral vision I saw a two-inch diameter "trunk" that I reflexively reached out to grab to stop my fall. Stop my fall I did, but with intense burning from the rows of tiny irritating spines sticking into my right palm and fingers. I had grabbed the "*Mal de Mujer*" (I think that's what it's called, some others who have been to the tropics know this plant well, I'm sure). It has vertical rows of deciduous spines like those of nettles, which I also react to strongly. I ended up with three diagonal rows of pustules across my right palm that first burned for several hours and then itched to no end for a week.

Another danger of lepping, is, of course, the terrain itself. We all have stories of tumbles, of getting stuck in muck, etc. I probably was never as concerned about such a problem as I was a couple of summers ago. On the way to the 2005 Lep Soc/SEABA meeting in Sierra Vista, AZ, my mom and I stopped in the Davis Mtns. to do a little butterflying. Well, a couple of the satyr species were flying in good numbers. My

mom had already netted a *Megisto rubricata* when a *Cercyonis meadi* went flying by. I pointed out that it was coming in her direction and she did a very adept spin and swing . . . and then proceeded to step on a loose rock and went into a head first dive downhill. Needless to say, my heart nearly stopped as I saw my very young 71 year old mom HEADED downhill for a few feet. Thankfully, there were no large objects in her way, except a large, thankfully somewhat rotten branch that stopped her head from smacking the harder ground. I immediately screamed "Are you alright?" to which she replied "Yes", followed by my "Are you sure?" and her "No!". But, we got her up, brushed her off, recovered her glasses which in the end suffered the worst as they were bent horribly out of shape, and with a couple of scratched places on one leg and a little spot on the side of her head, her next words were "Where's the next one?" Quite a trooper!!

And, last but not least, the truly bizarre. This is a danger of lepping I never would have thought of if it hadn't happened to me. For those of us who collect specimens, most have had, at one time or another, the unfortunate experience of cleaning up a bit after dermestids have destroyed a few specimens. One time, when I was much younger, I was cleaning out a drawer which had a few specimens that had been eaten by dermestids. Several shed larval skins and a bunch of dermestid frass was in the bottom of the drawer, and I decided the best way to get it out of the drawer was to blow. Bad choice. When I blew, the skins, etc. did indeed leave the drawer, and most went into the trash can I was holding the drawer over, but some of the hairs in turn went into my eye. I am apparently allergic to whatever chemicals are associated with the hairs of dermestid larvae. My eye, yes, my EYE (the sclera in particular), swelled up, making it



difficult to move my eye as it bulged a bit forward out of the eye socket. The cornea did not swell (no blood vessels in it), so that my eye looked truly weird as the sclera expanded out beyond the cornea. Again, as

with my spined-arm experience, after going to the ER, my sclera responded well to allergy medicine and rather quickly returned to normal size. Let this be a warning to anyone cleaning up dermestid remains!!

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

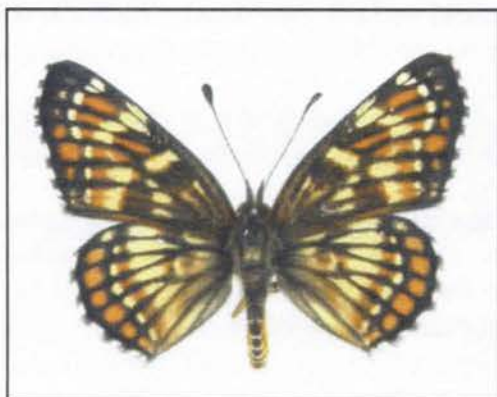
\*\*\*

(James K. Adams, 346 Sunset Drive SE, Calhoun, GA 30701, E-Mail: [jadams@em.daltonstate.edu](mailto:jadams@em.daltonstate.edu))

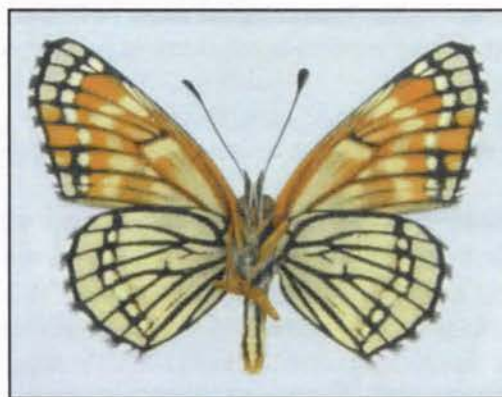
\*\*\*\*\*

## STRONG RETURN OF THE FULVIA CHECKERSPOT [*CHLOSYNE FULVIA FULVIA* (W. H. EDWARDS)]

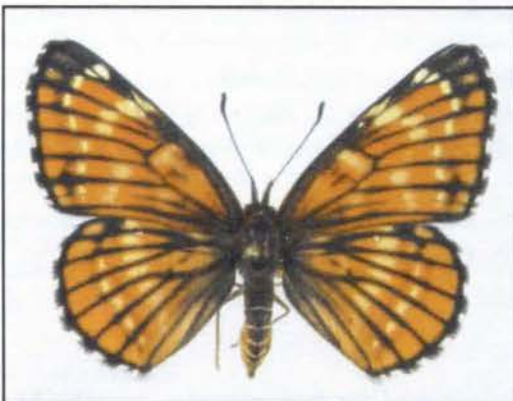
During the first week in April of this year the Fulvia Checkerspot [*Chlosyne fulvia fulvia* (W.H. Edwards)] was quite abundant at Buffalo Springs Lake in West Texas near the City of Lubbock. This beautiful checkerspot had been fairly rare in this part of Texas since the 1980ties. However, the rains came to the Lubbock area early in March and the vegetation at the Lake is probably the best in many years. And along with the rain came the Fulvia Checkerspot. Then came a late freeze on Easter weekend (April 7) which put a major dent in the Fulvia population, but not a death blow. The Fulvia Checkerspot was still flying late in April and into the middle of June.



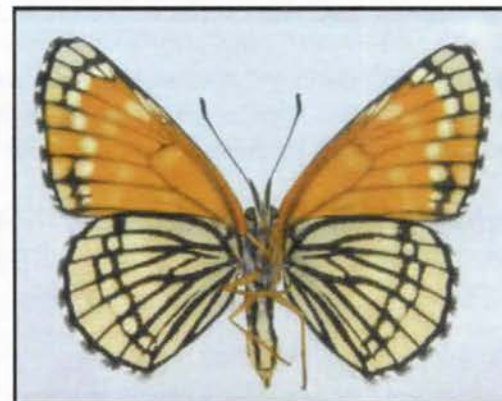
*Chlosyne fulvia fulvia*, male, dorsal



*Chlosyne fulvia fulvia*, male, ventral



*Chlosyne fulvia fulvia*, female, dorsal



*Chlosyne fulvia fulvia*, male, ventral

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

\*

## LOGICAL FALLACIES

Mr. Lawrence Hribar in his letter to The Editor (page 42) brings up some interesting points concerning Mr. David Fine's previous articles in the SLS News. While The Editor is not taking sides with either of the parties or any of the arguments as to whom is correct or incorrect (this can be left to the readers), it was deemed appropriate (and perhaps of interest) to define and discuss the reasoning behind *logical fallacies* that Mr. Hribar addresses.

**I. *Cum hoc ergo propter hoc* ("with this, therefore because of this"):** in this fallacy one assumes that because two things occur at the same time they must be causally related. However, correlation may occur without causation. This fallacy ignores other factors that may be the cause or causes of the events. For example:

A and B occur simultaneously,  
Therefore, A must be the cause of B

<sup>1</sup> "In this type of logical fallacy, one makes a premature conclusion about causality after observing only a correlation between two or more factors. Generally, if one factor (A) is observed to only be correlated with another factor (B), it is sometimes *taken for granted* that A is causing B *even when no evidence supports this*. This is a logical fallacy because there are at least four other possibilities:

1. B may be the cause of A, or
2. some unknown third factor is actually the cause of the relationship between A and B, or
3. the 'relationship' is so complex it can be labelled coincidental (*i.e.*, two events occurring at the same time that have no simple relationship to each other besides the fact that they are occurring at the same time).
4. B may be the cause of A *at the same time* as A is the cause of B (contradicting that the only relationship between A and B is that A causes B). This describes a *self-reinforcing system*.

In other words, ***there can be no conclusion made regarding the existence or the direction of a cause and effect relationship only from the fact that A is correlated with B.*** Determining whether there is an actual cause and effect relationship requires further investigation, even when the relationship between A and B is statistically significant, a large effect size is observed, or a large part of the variance is explained.

**Example:**

*Sleeping with one's shoes on is strongly correlated with waking up with a headache.  
Therefore, sleeping with one's shoes on causes headache.*

The above example commits the correlation-implies-causation fallacy, as it prematurely concludes that sleeping with one's shoes on causes headache. A more plausible explanation is that *both are caused by a third factor*, in this case alcohol intoxication, which thereby gives rise to a correlation. Thus, this is a case of possibility #2 above."

**II. *Post hoc ergo propter hoc* ("after this, therefore because of this"):** in this fallacy one assumes that there is a causal relationship if one thing happens after another. In other words temporal succession causes "*causality*" or chronology is confused with causation. For example:

A causes B because  
A occurs before B

**Example:**

<sup>2</sup> "Every time that rooster crows, the sun comes up. That rooster must be very powerful and important!"

<sup>3</sup> "If someone hangs the laundry out and then it rains, we may say jokingly that Murphy's Law was invoked by hanging out the laundry, thus causing the rain. This is one of a family of colloquial jests based on the fallacy of coincidental correlation. [<sup>4</sup> Human beings have a highly developed facility for pattern recognition; in fact, we often



perceive pattern where there is none.] We also have a desire for predictability, and control over events. Often these attributes lead us to subscribe to the fallacy of coincidental correlation -- not in jest, but quite seriously.

Fortunately for the shamans, clairvoyants, astrologers and amateur weather forecasters of the world, people remember most clearly those events in which expectation or prediction was fulfilled, and tend to forget those events in which expectation was disappointed. If a would-be magus uses voodoo dolls to curse ten enemies, and one victim suddenly dies, this 'success' will be remembered strongly and the nine failures discounted. Wishful thinking and overzealous pattern recognition both play a part in uncritical acceptance of *post hoc ergo propter hoc*."

### III. *Non causa pro causa* ("no cause for cause"):

<sup>5</sup> "The argument offers an explanation that confuses correlation with causality. One event is cited as the cause of another, but, while there may actually be a connection between the two events, the hypothesis mis-locates it, either making the effect into the cause, or treating as cause and effect two events that are independent results of a common cause.

#### Example:

*Putting more police on the streets actually causes crime to increase!*

When we increased the number of cops on the beat, the number of crimes witnessed by police actually went up."

#### Sources Cited

1. [http://en.wikipedia.org/wiki/Correlation\\_does\\_not\\_imply\\_causation](http://en.wikipedia.org/wiki/Correlation_does_not_imply_causation)
2. Bruce Thompson's Fallacy Page: <http://www.cuyamaca.edu/bruce.thompson/fallacies/posthoc.asp>
3. Hake H.W. and Hyman R. (1953), Perception of the statistical structure of a random series of binary symbols, *J. of Experimental Psychology*, 45, 64-74.
4. D.A. Clarke and Riley Geary, *Post Hoc Ergo Propter Hoc*, Bad Science and Public Policy: <http://www.ucolick.org/~de/AltTrans/posthoc.html>
5. Bruce Thompson's Fallacy Page: <http://www.cuyamaca.edu/bruce.thompson/Fallacies/noncausa.asp>

■ ■ ■ ■ ■    ■ ■ ■ ■ ■    ■ ■ ■ ■ ■    ■ ■ ■ ■ ■    ■ ■ ■ ■ ■

*Perhaps, these explanations and examples will help (and hopefully will not be insulting to the intelligence of the members of the SL Society and the readers of the NEWS) in interpreting Mr. Lawrence Hribar's letter to The Editor which follows on page 42 [The Editor].*

\*\*\*\*\*

## CALL TO ACTION OR I NEED SOME INPUT!

SOUTHERN LEPIDOPTERISTS' SOCIETY MEMBERS I am in need of articles for your NEWSLETTER!!! Surely, there must be something that you have come across in your travels in the field that you could write about and thus share with your fellow Society members. How about some photographs of butterflies and moths either pinned or in nature that you find interesting. How about the one that got away and the one that did not. Anybody raising larvae? If you are you must be taking photographs. Send them to me for publication in the NEWS. [The Editor]

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*

## LETTER TO THE EDITOR

I am writing in response to two articles that appeared recently in *Southern Lepidopterists' News* (Fine, 2006; 2007). In the first article, Mr. Fine makes the statement that Lepidoptera collecting in the Florida Keys is "virtually worthless" after May due to "mosquito spraying" (Fine, 2006). I have addressed this statement in an article that I submitted to *Wing Beats* magazine, but I feel it is only fair that I repeat some of that discussion here; I doubt Mr. Fine subscribes to *Wing Beats*.

The contention made by Fine (2006) that collection opportunities are "worthless" because of "mosquito spraying" can be attributed to the logical fallacies "*cum hoc ergo propter hoc*" (with this, therefore because of this) and "*post hoc ergo propter hoc*" (after this, therefore because of this). The second, "*post hoc*", is an example of coincidental correlation, wherein unrelated variables appear to correlate with each simply because of their sequence in time (Anonymous, undated). I suggest that abundance of Lepidoptera and abundance of mosquitoes are related to, and correlated with, precipitation.

Mosquito abundance in the Florida Keys is correlated with rainfall (Hribar, 2002a;b). Number and timing of mosquito control operations are correlated with mosquito abundance (Hribar, submitted). Minno and Emmel (1993) discuss the phenology of butterflies in the Florida Keys and report "two small peaks of diversity". One occurs in April and May, and the other in September and October. Why at these times? Minno and Emmel (1993) explain that the April-May peak is the beginning of the wet season, and the September-October peak occurs at the end of the wet season. They (Minno and Emmel, 1993) furthermore state that the timing of the peak is dependent on "*the mildness of the winter and the amount, frequency, and timing of precipitation.*" The word "peak" implies a maximum (relative or absolute) from which there is a decline. The Florida Keys have been in a drought situation at least since 1998 (NOAA, 2006; SFWMD, undated); currently Florida is experiencing a widespread and severe drought. NOAA's rainfall data reveal that 60% of time since January 1998 rainfall has been below normal; the statewide Z index indicates repeated short-term droughts during that same period (NOAA, 2007). If there truly is a decline in butterfly numbers in the Florida Keys after April or May, it is just as likely due to their natural seasonal distribution as to any perceived relation to mosquito control activity. A comparison of Figures 5 & 49 in Minno and Emmel's book certainly is suggestive of such a relationship. I will also note that the Florida Keys Mosquito Control District makes fewer adulticide missions than we are permitted to; we have legal authority to make many more applications but we do not for a variety of reasons both biological and ecological. Furthermore, even though I am not an avid collector, I do have specimens in my collection that I collected during every month of the year. Rather than "*post hoc ergo propter hoc*", we have "*non causa pro causa*" (no cause for cause).

In Mr. Fine's second article (Fine, 2007) he makes a number of statements that I feel require comment. The first, on page 26, is that the Keys were affected far less in recent storms than was the mainland. Monroe County had 437 families who were housed in FEMA trailers after Wilma, mine among them. As of this writing, 59 families are still not in their homes (Busweiler, 2007). As for the entomofauna of the Florida Keys, I noticed reductions in numbers of some species, in particular Pyrrhocoridae (Heteroptera) (Hribar, 2007).

Mr. Fine makes two statements on page 27 that must be addressed. He first writes, in the middle column, that "*pesticides certainly kill every Lep in its (sic) path where sprayed*". I have been asked not to comment specifically on ongoing research, but I can say, based on a cooperative study being conducted by the Florida Keys Mosquito Control District, Florida A&M University, and the University of Florida, among others, that may not be the case. (I would have stated this in much stronger terms but I am respecting the wishes of other people.)

Also on page 27, Mr. Fine implies that colonies of *Strymon acis bartrami* are being exterminated by mosquito control operations. I wonder whether he has data to support such a statement or if it is mere conjecture. I do know that in 2005 the population of *S. acis bartrami* on Big Pine Key was described as "*thriving*", "*abundant*", and "*doing great*" (<http://tech.groups.yahoo.com/group/TILS-leps-talk/message/13637> & <http://tech.groups.yahoo.com/group/TILS-leps-talk/message/13642>). We at the Florida Keys Mosquito Control District are not content, however, to accept the opinions of others, no matter how favorable to us they may be; we have engaged the services of professional lepidopterists to survey the *S. acis bartrami* population and report on its status.

The only data I could find on *S. acis bartrami* numbers on Big Pine Key come from the US Fish & Wildlife Service (Morekill, 2007). It appears that numbers of Bartram's hairstreak actually increased for three consecutive years (1997-1999), after which there was a decline. Interestingly enough, during the period 1999-2006, the number of



mosquito control aerial operations flown on Big Pine Key has declined as well (FKMCD, 2006). In fact, the declining number of Bartram's hairstreaks is correlated with the declining number of aerial missions flown ( $r = 0.73$ ). If we are going to think along the lines of "*cum hoc ergo propter hoc*" then it must follow that there are fewer butterflies due to fewer mosquito control aerial operations. I suspect, however, we are again looking at "*non causa pro causa*".

I want to conclude by expressing my hope that Mr. Fine and his family have fully recovered from the effects of Wilma. I know firsthand what it is to suffer the losses and I would not wish that experience upon anyone.

Sincerely,

Lawrence Hribar

#### Literature Cited

- Anonymous.** Undated. *Post hoc ergo propter hoc*. Accessed November 7, 2006. [http://en.wikipedia.org/wiki/Post\\_hoc\\_ergo\\_propter\\_hoc](http://en.wikipedia.org/wiki/Post_hoc_ergo_propter_hoc)
- Busweiler, R.** 2007. FEMA trailer dwellers face deadline. Accessed April 24, 2007. <http://www.keysnews.com/288682526298089.bsp.htm>
- Fine, D.** 2006. Spring leps in Florida. *Southern Lepidopterists' News* 28: 36-47; 68.
- Fine, D.** 2007. Immediate effects of Hurricane Wilma on butterflies of Broward Co., Florida. *Southern Lepidopterists' News* 29(1): 21-28.
- FKMCD** [Florida Keys Mosquito Control District]. 2006. Efficacy of larvicidal treatment of wilderness islands for reduction of adulticidal treatment of areas adjacent to Key Deer National Wildlife Refuge, and Great White Heron National Wildlife Refuge, Big Pine Key, Florida. Unpublished report.
- Hribar, L.J.** 2002a. Mosquito (Diptera: Culicidae) collections in the Florida Keys, Monroe County, Florida, USA. *Studia Dipterologica*, 9: 679-691.
- Hribar, L.J.** 2002b. Relation of *Culex bahamensis* Dyar & Knab, 1906 (Diptera: Culicidae) to rainfall and tides on Grassy Key, Florida, USA. *The Annals of Medical Entomology*, 11: 11-16.
- Hribar, L.J.** 2007. Notes on some insects of the Florida Keys. *Florida Scientist* 70(2): In press.
- Hribar, L.J.** Submitted. Seasonal distribution of adulticide missions in the Florida Keys. *Wing Beats* (manuscript submitted for publication).
- Minno, M.C. and T.C. Emmel.** 1993. *Butterflies of the Florida Keys*. Scientific publishers: Gainesville, Florida.
- Morekill, A.E.** 2007. Region 4 Intra-Service Section 7 Biological Evaluation Form: Aerial application of Dibrom (naled) on lands of the National Key Deer Refuge for the control of mosquitoes.
- NOAA** (National Oceanographic and Atmospheric Administration). 2006. Drought in the Florida Keys. Accessed April 24, 2007. <http://www.srh.noaa.gov/key/HTML/Drought%20in%20the%20Keys.html>
- NOAA** (National Oceanographic and Atmospheric Administration). 2007. Accessed April 24, 2007. <http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/st008dv00pcp.html>
- SFWMD** (South Florida Water Management District). Undated. Florida Experiencing Record Drought! Accessed April 24, 2007. [http://my.sfwmd.gov/portal/page?\\_pageid=1874,9496104,1874\\_19616129&\\_dad=portal&\\_schema=PORTAL](http://my.sfwmd.gov/portal/page?_pageid=1874,9496104,1874_19616129&_dad=portal&_schema=PORTAL)

\*\*\*\*\*

**PLEASE NOTE:** The Southern Lepidopterists' Society and the Editor of the SLS NEWS thank the American Museum of Natural History (Central Park West at 79<sup>th</sup> Street, New York, NY 10024) and Dr. Enrique Peñalver and Dr. David A. Grimaldi for allowing us to republish their article "*New Data on Miocene Butterflies in Dominican Amber (Lepidoptera: Riodinidae and Nymphalidae) with the Description of a New Nymphalid*" (Number 3519, July 31, 2006) in our Newsletter (pages 44 to 59). The original publication is on the American Museum of Natural History website: <http://digitallibrary.amnh.org/dspace/handle/2246/5796>.

\*\*\*\*\*

**DEFINITIONS** - *lunula* (also *lunule*) any structure or marking in the shape of a crescent; a crescent shaped mark.

*maculation* - the pattern of spots (bars, chevrons, and other markings) on an animal (butterfly/moth) or plant.

\*\*\*\*\*  
\*\*\*\*\*

## AMERICAN MUSEUM

*Novitates*

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY  
CENTRAL PARK WEST AT 79TH STREET, NEW YORK, NY 10024

Number 3519, 17 pp., 5 figures

July 31, 2006

New Data on Miocene Butterflies in Dominican  
Amber (Lepidoptera: Riodinidae and Nymphalidae)  
with the Description of a New Nymphalid

ENRIQUE PEÑALVER<sup>1</sup> AND DAVID A. GRIMALDI<sup>2</sup>

## ABSTRACT

A new, virtually complete and well-preserved female specimen of *Voltinia damba* Hall, Robbins, and Harvey, 2004 (Lepidoptera: Riodinidae) provides new data on this fossil species, and a new fossil species of the Recent genus of Nymphalidae *Dynamine* Hübner, 1819 (Lepidoptera: Nymphalidae) is described as *Dynamine alexae* n. sp., on the basis of a male specimen. The two species are preserved in Miocene amber from the Dominican Republic. *Dynamine alexae* n.sp. represents the first adult nymphalid butterfly found as a fossil in amber. The four taxa of butterflies found up to the present in Dominican amber indicate post-Miocene extinctions in Hispaniola, probably caused by insularization. The butterflies found in Dominican amber do not support a hypothesis of a Gondwanan origin for many butterfly tribes and subfamilies as previously proposed; we conclude that this hypothesis is implausible based on the age of the butterflies as inferred from the fossil record. Some palaeoecologic and taphonomic questions are discussed.

## INTRODUCTION

Amber preserves delicate arthropods, mainly insects, with high fidelity, including microscopic features like setae and sensilla on the external cuticle as well as wing and other color patterns (Grimaldi, 1996). In some cases amber preserves soft internal tissues, including cells, organelles, and even endosymbiotic spirochetes and protists (Grimaldi, 1996; Grimaldi et al., 1994; Henwood 1992a, 1992b; Wier et al., 2002).

The most diverse organisms in amber are insects, particularly of the orders Diptera, Hymenoptera, and Coleoptera. Lepidoptera specimens tend to be less common and even rare in amber, the principal record being adult moths. The fossil record of adult butterflies in the world, from the Paleocene to Miocene, contains

approximately 50 specimens, known, comprising about 33 named species in all living families, but only seven of the specimens have been found in amber, all of them in Dominican amber (Grimaldi and Engel, 2005). For Miocene Dominican amber, the list of fossilized Lepidoptera includes other families: Blastobasidae, Cosmopterygidae, Gelechiidae, Noctuidae, Tineidae and Tortricidae (Poinar [1992]), Tortricidae (Poinar and Brown [1993]), and Oecophoridae (Kristensen and Skalski [1999]). Grimaldi and Engel (2005) figured a caterpillar and two adults of the family Geometridae, an adult of the genus *Acrolophus* (Acrolophidae), and other adults of Tortricidae and Gelechioidea; an interesting tineoid moth figured by these authors is a case with

<sup>1</sup> Division of Invertebrate Zoology, American Museum of Natural History (penalver@amnh.org).

<sup>2</sup> Division of Invertebrate Zoology, American Museum of Natural History (grimaldi@amnh.org).



the caterpillar inside. The scarce butterflies found in Dominican amber have been studied in detail, and are represented as caterpillars of the families Nymphalidae and Riodinidae (DeVries and Poinar, 1997; Hammond and Poinar, 1998) and adults of Riodinidae (Poinar, 1992; Grimaldi, 1996; DeVries, 1997; Hall et al., 2004).

Here, we report two additional adult butterfly specimens of the families Riodinidae and Nymphalidae as inclusions in Miocene Dominican amber; the nymphalid specimen is the first adult known of this family preserved in amber.

The family Riodinidae contains about a thousand species, most of which occur in the American tropics and are partly characterized by the greatly reduced male forelegs and the silver or leaden spots in the wings, which is why these butterflies are commonly named metalmarks (see DeVries, 1997). Riodinid caterpillars and pupae resemble those of lycaenids, which is why some authors classify them into a single family (Kristensen, 1976; De Jong et al., 1996), though the families are usually considered sister groups (Ackery et al., 1999). The family Riodinidae contains three subfamilies (Nemeobiinae, Euselasiinae and Riodininae). Riodininae, the largest subfamily, is divided into eight tribal groupings; two of them—Mesosemiini and Eurybiini—possessing five forewing radial veins; the other six possess four forewing radial veins (Hall, 2003). The Riodinidae fossil record is comprised only of a caterpillar specimen (DeVries and Poinar, 1997; see the discussion about other putative riodinid fossils in Hall et al., 2004) and the recently described species *Voltinia dramba* based on five adult females (Hall et al., 2004), both preserved in Miocene Dominican amber. A new female specimen of *Voltinia dramba* in the collection of the American Museum of Natural History (AMNH) provides an opportunity to complete some details in the description of this interesting species. The most recent investigations on the phylogeny of Riodinidae are Harvey (1987) in Hall (2003), plus the subsequent contributions by Hall (1998, 1999) and Hall and Harvey (2002). The most recent study on the phylogeny of the subfamily Riodininae, by Hall (2003), is a cladistic analysis of the 16 genera that have five forewing radial veins; this study coded data on the adult ecology, wing venation and pattern, the adult head and body, male and female genitalia, and early-stage ecology and morphology. That analysis confirmed the monophyly of the tribes Mesosemiini and Eurybiini, and established two subtribes for Mesosemiini (Mesosemiina and the new subtribe Napaeina). The fossil species *Voltinia*

*dramba* belongs to the subtribe Napaeina. For Hall (2003), the best hypothesis about the relationships among the four- and five-radial-vein groups of Riodininae is Mesosemiini + (Eurybiini + all four-radial-vein tribes).

The Nymphalidae is the most diverse family of butterflies, with more than 6,000 described species worldwide. The nymphalid butterflies are found in virtually every terrestrial habitat except Antarctica, and have their greatest diversity in the Neotropics (DeVries, 1987). The nymphalids are characterized by very short forelegs in males and females, on which the males of many species carry a “brush” of long scales. The family contains many colorful, large species, and most of the mimicry complexes in butterflies. Nymphalid larvae feed on dicotyledonous plants, very often toxic ones, and they are also generally adorned with a variety of spines and tubercles (DeVries, 1987; Smith et al., 1994). The species of Nymphalidae have been placed into more than 500 genera classified into 12 subfamilies. The oldest nymphalid fossil is an undescribed form from the Early Eocene of Green River (Colorado), but its classification within the family is unclear, and other Eocene records are several species described from Florissant (reviewed in Grimaldi and Engel, 2005). The systematic relationships among the subfamilies and tribes of Nymphalidae are still poorly known and thus the phylogeny of the family has been frequently discussed. There is some evidence of a sister-group relationship between Lycaenidae and Nymphalidae, and Pieridae is possibly the sister group of the Lycaenidae + Nymphalidae (De Jong et al., 1996). Freitas and Brown (2004) presented a historical overview of Nymphalidae phylogeny. Two recent studies, using the wingless gene (Brower, 2000) and mitochondrial and nuclear genes (Wahlberg et al., 2003), concluded that many of the traditional subgroups are monophyletic. The latest and most complete cladistic analysis to date, using 234 characters from all life stages of 95 nymphalid species, has been published by Freitas and Brown (2004), concluding that the taxa can be grouped into six main lineages and it supports the monophyly and relationships of most presently recognized subgroups. That study also supported the position of the subfamily Libytheinae as the basal group of Nymphalidae.

Due to the poor fossil record of butterflies, they have rarely been used in phylogenetic studies. For this reason it is very important to study all remains found in the fossil record, like the two specimens embedded in Dominican amber described here.

## PEÑALVER AND GRIMALDI: MIOCENE AMBER BUTTERFLIES

## MATERIAL AND METHODS

Dominican amber is fossil resin that was formed by an extinct species of *Hymenaea* tree (Leguminosae: Caesalpinioidea), and is mid-Miocene in age (Iturralde-Vinent and MacPhee, 1996; see the discussion in Grimaldi, 1995, about the erroneous dating of this amber as Eocene-Oligocene by some authors). This amber derives mainly from outcrops in the mountains in the north and northeast of Santiago. The material studied here was acquired through purchase, and as such its exact provenance within the outcrops of Dominican amber mines is unknown, but its authenticity is certain, based on physical characteristics and typical preservation of the inclusions.

The pieces were polished and some parts of the specimens were studied using sugar gel applied between the amber surface and a slide, which reduces the optical distortion caused by the curvature and imperfections of the amber surface. Photomicrography used the Infinity<sup>®</sup> K-2 long distance microscope and the MicroOptics<sup>®</sup> fiber optic flash unit (www.microoptics.com). The specimens were drawn using a drawing tube attached to a Zeiss Stemi SV8 stereoscope. Specimens are housed in the amber fossil collection, Department of Invertebrate Zoology, AMNH.

## SYSTEMATIC PALEONTOLOGY

CLASS INSECTA LINNAEUS, 1758

ORDER LEPIDOPTERA LINNAEUS, 1758

SUPERFAMILY PAPILIONOIDEA  
LATREILLE, 1802

FAMILY RIODINIDAE GROTE, 1895

SUBFAMILY RIODININAE GROTE, 1895

TRIBE MESOSEMIINI BATES, 1859

SUBTRIBE NAPAEINA HALL, 2003

GENUS VOLTINIA STICHEL, 1910

*Voltinia dramba* Hall, Robbins,  
and Harvey, 2004  
Figures 1, 2a-c

**MATERIAL:** AMNH DR-18-1 (female) in a large clear piece of amber measuring 83 mm length x 44 mm width x 24 mm thickness. The piece also contains small specimens (syninclusions) of three dipterans, two beetles, one moth (of the superfamily Gelechioidea), one hymenopteran of undetermined family and one Chalcidoidea, one mite, and one seed.

This butterfly is virtually complete and well preserved, lacking only the antennae, the proboscis and small portions of the posterior area of the hind wings. The wings are overlapping. The venation and color pattern of the left wings are very well preserved. The specimen occurs in a piece that, prior to purchase, was broken into several portions, which were then fused with adhesive.

**DESCRIPTION:** **Head** with eyes bare, having entirely brown margins. **Thorax** brown, length 5.08 mm. **Forewing** shape triangular; length 23.6 mm, greatest width 14.9 mm. Five radial veins (fig. 1a). Underside with three narrow, straight white bars at base of CuA<sub>2</sub> cell, the distal one is faint, and other three in discal cell, all separated by darker brown areas. A faint bar present at the base of M<sub>1</sub> and M<sub>2</sub> cells, separated from the discal cell by a darker brown area. Three lines of white spots in cells R<sub>2</sub> to M<sub>2</sub> (straight diagonal line), in cells CuA<sub>1</sub> to A<sub>1</sub> + A<sub>2</sub> at level of middle disco-cellular vein (straight line), and in cells R<sub>3</sub> to CuA<sub>2</sub> (submarginal line comprised of eight spots, including a very small spot at base of cell R<sub>4</sub>). Two additional white spots present in cell M<sub>3</sub>, one closest to the base and another in the distal part. Faint spot in cell CuA<sub>2</sub> present between the two lines that cross this cell. **Hind wing** length 19.9 mm, greatest width 13.9 mm. Underside with three narrow, straight white bars at base of CuA<sub>2</sub>; distal one is curved, and other three in discal cell, all separated by darker brown surfaces (fig. 1b). Narrow, straight white bars in middle of CuA<sub>1</sub>, CuA<sub>2</sub>, and A<sub>1</sub> + A<sub>2</sub> cells (only the distal color pattern of cell M<sub>3</sub> is visible); the bars of CuA<sub>1</sub> and CuA<sub>2</sub> have a darker brown basal margin and a closer small white spot on the distal margin. Submarginal, darker brown spots at least in cells M<sub>3</sub>, CuA<sub>1</sub>, and CuA<sub>2</sub> (the last two are not complete). These spots large, semicircular in shape, with narrow pale border. Wing pattern in cells Sc + R<sub>1</sub> to M<sub>2</sub> not visible. **Legs** brown; hind leg with distal tibial spur (length 0.28 mm) and white scales on coxa (fig. 1d). Length of femora, tibiae, basitarsi, and tarsi II + III + IV + V in mm:



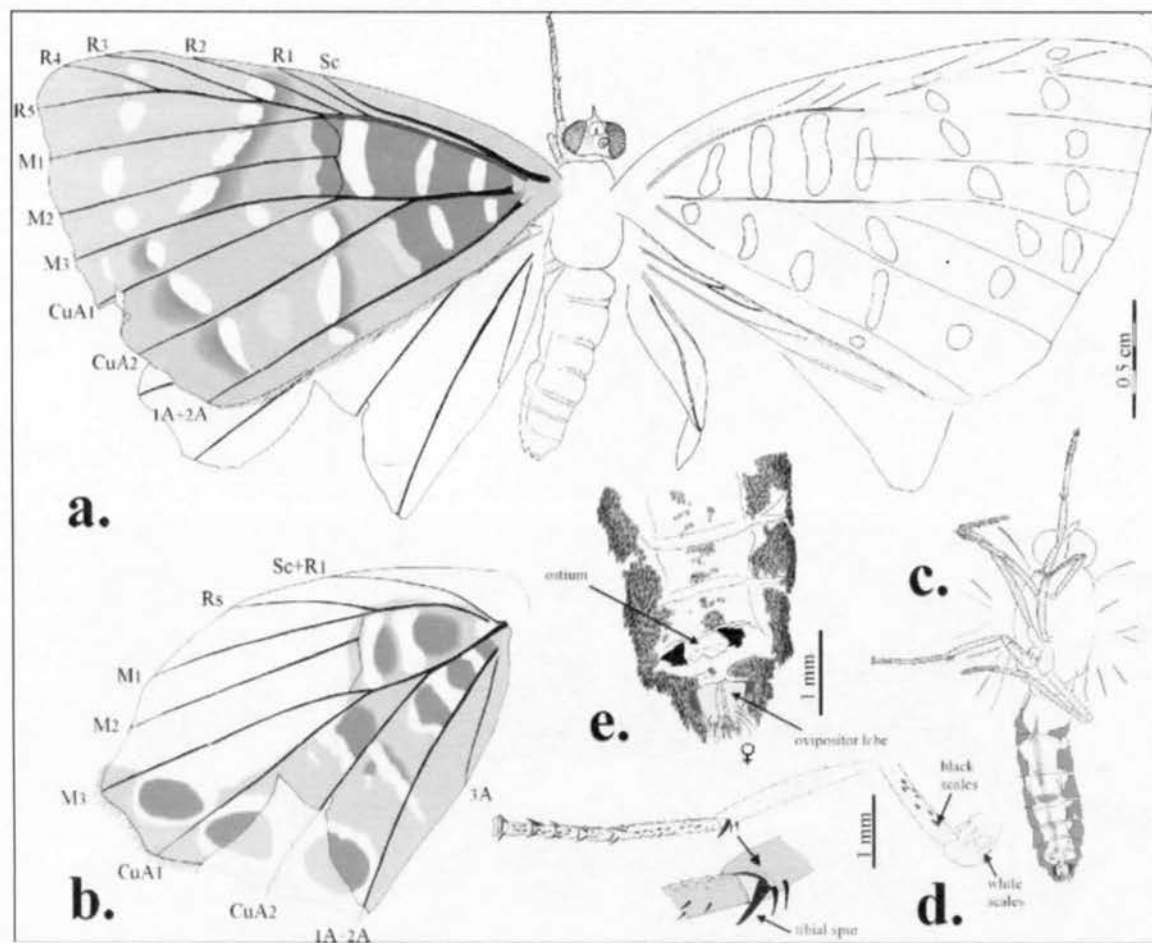


Fig. 1. Camera lucia drawings of the new specimen of *Voltinia dramba* (AMNH DR-18-1) in Miocene amber from the Dominican Republic. **a.** Complete dorsal view of body with the color forewing pattern. **b.** Hind wing with the color pattern preserved. **c.** Ventral view of body. **d.** Hind leg. **e.** Female genitalia. a-c to same scale.

foreleg 2.15, 1.31, 0.69 and 0.92; midleg 3.54, 2.31, 1.38 and 1.15; hind leg 2.69, 3.15, 1.46 and 1.62. Claws unforked. **Abdomen** brown dorsally, ventral surface laterally brown and with a longitudinal band of pale brown scales (fig. 1c). Length 8.15 mm, greatest width 2.31 mm. **Female genitalia** preserves the ostium of the bursa in segment VIII and the ovipositor lobes, which are of moderate size (fig. 1e).

**NEW CHARACTERISTICS FOR *V. DRAMBA*:** The new specimen has practically the same wing color pattern as previously described specimens of the species, but shows some slight differences. The new specimen has a very small white spot at the base of cell  $R_4$  and a faint spot in cell  $CuA_2$  between the two lines that cross this cell, both in the forewing. Also, the new specimen has two spots not present in the original description of the species, one distal faint spot in cell  $M_3$  and a white spot, in line, on cell  $A_1 + A_2$ . In addition, the new specimen lacks the extra faint spot at the base of cell

$CuA_1$  in the hind wing.

The most important difference observed in our specimen is the presence of a distal spur in the hind tibia. In addition, the ventral surface of the abdomen is laterally brown and has a longitudinal band of pale brown scales (vs. the ventral surface of the abdomen being completely brown in the original description).

**COMMENTS:** This specimen was erroneously referred to as a nymphalid by Grimaldi and Engel (2005: fig. 13.68). Ironically, this identification was based on study of the specimen by several experienced lepidopterists. The male for this fossil species is as yet unknown. The fracture surfaces of the amber piece hinder observation of the right wings, but their venation and color pattern have been drawn and compare well with those of the left wings. The color pattern of the anterior middle area of the hind wings has not been observable due to the overlapping of the wings.

Hall et al. (2004) placed *V. dramba* in the tribe

## PEÑALVER AND GRIMALDI: MIOCENE AMBER BUTTERFLIES

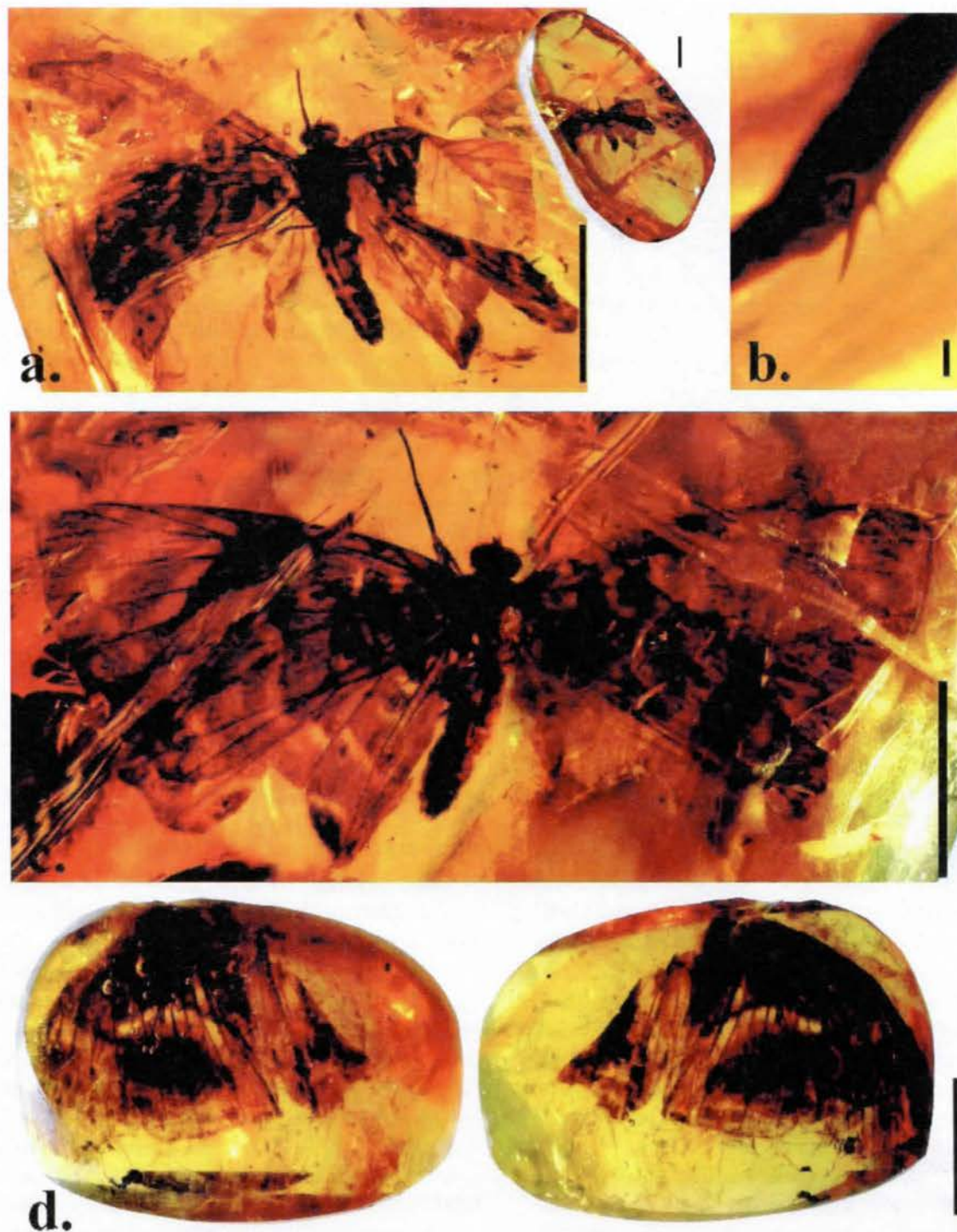


Fig. 2. Photomicrographs of Miocene butterflies in Dominican amber. **a.** Female of *Voltinia dramba* (AMNH DR-18-1) in ventral view, and complete view of the amber piece. **b.** Apical tibial spur in the hind leg of the same specimen. **c.** Dorsal view of the new *Voltinia dramba* specimen; this butterfly is fossilized with the wings at an angle and so this image was made with six consecutive pictures of the specimen taken at successive focal planes. **d.** Male of *Dynamine alexae* n.sp. holotype (AMNH DR-18-2) in dorsal (left) and ventral view (right). Scale bars = 1 cm in panels a, c, d; = 0.1 mm in panel b.



Mesosemiini because it apparently lacked a hind tibial spur, in addition to other characters. However, in the new specimen an apical spur on the hind tibia is clearly present (figs. 1d, 2b). It is not easy to observe this structure, and surely it is present in the fossil specimens studied by Hall et al., though probably obscured. The presence of a spur does not preclude placement of the fossil riodinids in the tribe Mesosemiini and in the genus *Voltinia*, since this character is present in the extant species *V. radiata* and *V. theata* and in some other genera of Mesosemiini (Hall, 2003; Hall et al., 2004). However, this is an important character for understanding relationships in the genus.

The differences observed in the color pattern of the new specimen are not indicative of a distinct species. These differences may be a consequence of intraspecific variation and/or distinct preservation. It is well documented that butterfly wing patterns frequently show spectacular differences among individuals of the same species (e.g., Brakefield and French, 1999). Some additional spots observed in the new specimen are faint, and possibly not evident in all the fossils. Hall et al. (2004) even indicated that the wing pattern reconstruction was adapted from the sister species *V. danforthi*, and presumably is a combination of the wing patterns of the five specimens. We describe the differences observed because variation for this species is presumably significant.

The riodinid caterpillar found previously in Dominican amber was identified as a member of the genus *Theope* (DeVries and Poinar, 1997), which belongs to the tribe Nymphidiini.

#### FAMILY NYMPHALIDAE SWAINSON, 1827

#### SUBFAMILY BIBLIDINAE BOISDUVAL, 1833

#### TRIBE DYNAMININI BURMEISTER, 1878

#### Genus *Dynamine* Hübner, 1819

TYPE SPECIES: *Papilio mylitta* Cramer, 1780: 107.  
By subsequent designation (Scudder, 1875: 160).

#### *Dynamine alexae*, new species

Figures 2d, 3, 4, 5

MATERIAL: AMNH DR-18-2 (male), holotype, in an amber piece 32 mm length x 22 mm width x 8 mm thickness.

The holotype is incomplete, having lost the anterior

part of the body at the surface of the amber (figs. 2d, 3), specifically the head, the anterior part of the thorax, most of the right wings and proximal portions of the left fore- and hind wings. Preserved are only the distal part of the mid- and hind legs, most of the left wings, and abdomen with genitalia. The wings partly preserve the color pattern as tones of brown and are overlapping. The wing surfaces have small to medium gas bubbles trapped during immersion in the resin.

ETYMOLOGY: Patronym in honor of Mrs. Alex Goelet, wife of Mr. Robert G. Goelet, Chairman Emeritus and trustee of the AMNH; for their generous sponsorship of research at the AMNH.

TYPE LOCALITY: Mid-Miocene amber from mines in the Cordillera Septentrional, north and northeast of Santiago, Dominican Republic (Hispaniola).

DIAGNOSIS: According to wing size this new *Dynamine* species was large. Greatest width of the hind wing larger than greatest width of the fore wing (HW/FW 5 1.19). White median band under both fore and hind wings; costal white subband on fore wing covers  $M_3$ - $CuA_1$  cell and ends in  $CuA_1$ - $CuA_2$ . Two identical ocelli under hind wing. Continuous, broad, brown postmedial band under hind wing connects the two ocelli, and has a broad, pale brown proximal margin. Two strong, short apical spines at apex of each male valve, one dorsal and one ventral.

DESCRIPTION: Large body size. **Forewing** (figs. 3a, 4): the preserved portion of forewing indicates a triangular shape (fig. 4), inferred length is 25.80 mm, and the greatest width is 16.11 mm; L/W inferred = 1.60. White median band on underside broken at level of  $CuA_1$  in two subbands, the apical part of the costal subband covers  $M_3$ - $CuA_1$  cell and ends in  $CuA_1$ - $CuA_2$ ; apical part of anal subband ending in vein  $CuA_1$ . **Hind wing** (figs. 3b, 4): equal in length and width (inferred length is 18.75 mm and greatest width 19.17 mm); L/W inferred 5 0.98. White underside with ocelli and brown bands: underside with paired submarginal ocelli in  $M_1$ - $M_2$  and  $CuA_1$ - $CuA_2$ , identical and very circular in shape; ocelli connected by broad, brown, continuous postmedial band (this band has a broad pale brown proximal margin); one wide medial brown band preserved has a pale area in the anal region; distal marginal brown band has a longitudinal, pale band for entire length. Proximal part of wing is not preserved. Margin without expansions or tails. **Legs**: Tibiae with white scales ventrally and two large apical spurs. Mid and hind tarsomeres with four rows of strong setae (two ventral and two ventrolateral), except for tarsomere V, which has two rows of ventral setae (fig. 3d). Length



## PEÑALVER AND GRIMALDI: MIOCENE AMBER BUTTERFLIES

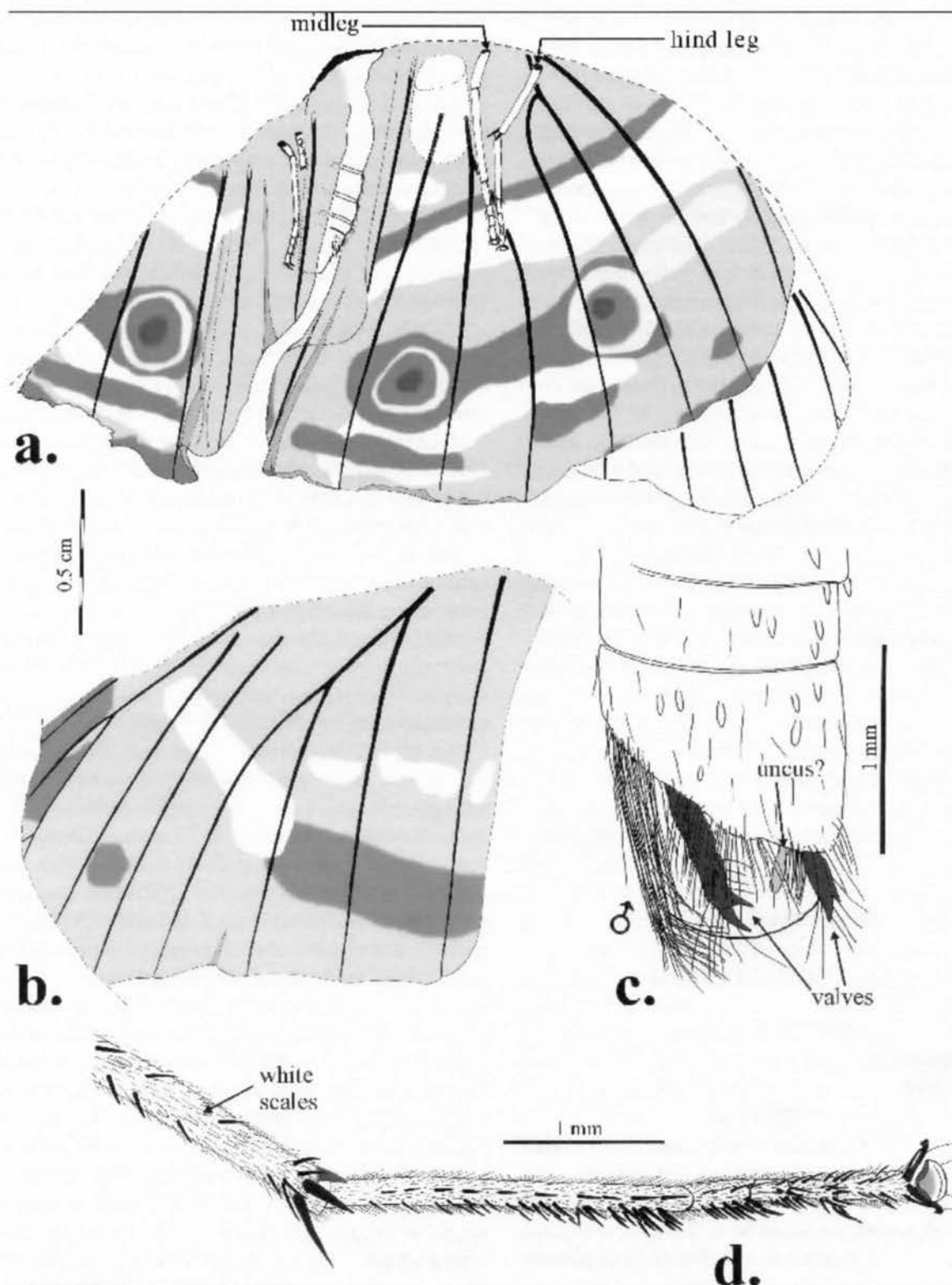


Fig. 3. Camera lucida drawings of *Dynamine alexae* n.sp (AMNH DR-18-2) in Miocene amber from the Dominican Republic, holotype. **a.** Body ventral view with the hind-wing color pattern preserved. **b.** View of the upper side of the forewing, showing the preserved color pattern. **c.** Male genitalia. **d.** Hind leg. a-b to same scale.

of tarsomeres of midleg: I, 0.7 mm; II, 0.73 mm; III, 0.43 mm; IV, 0.29 mm; and V, 0.52 mm. Length of tarsomeres of hind leg: I, 2.29 mm; II, 0.51 mm; III, 0.23 mm; IV, 0.26 mm; and V, 0.46 mm. White scales present on tibiae. Claws unforked. **Abdomen** dorsally and laterally dark brown and white ventrally. **Male genitalia** with valves exposed, which are long, flattened, and narrow, and a narrow tubular structure that possibly corresponds to the uncus (figs. 3c, 5); the apex of each valve has two strong, short spines, one dorsal and one ventral.

**COMMENTS:** The female for this new fossil species is as yet unknown. The reconstruction of the wing color pattern of the preserved areas was partial (fig. 4) because the wings are incomplete, overlapping, and touching.

This specimen belongs to the genus *Dynamine* due to the combination of the following characters: presence of a white median band on fore- and hind wings, absence of ocelli on the forewing, two ocelli under the hind wing restricted to  $M_1-M_2$  and  $CuA_1-CuA_2$  and connected by a broad brown band, hind wing margin without expansions or tails, and a dark brown abdomen that is white ventrally. Some species of *Dynamine* do not have ocelli, but the two extant species present in the Antilles have ocelli. We include the genus *Dynamine* in the subfamily Biblidinae and tribe Dynamini, sensu Oppler and Warren (2003) and Freitas and Brown (2004). The subfamily Biblidinae is one of six groups that have been established by the cladistic analysis of Freitas and Brown (2004).

The family Nymphalidae has been found previously in Dominican amber, represented by a caterpillar placed near the genus *Smyrna* of the subfamily Nymphalinae (Hammond and Poinar, 1998), and thus without any relationship to the new fossil nymphalid specimen.

**COMPARISON WITH EXTANT DYNAMINE:** The genus *Dynamine* has very characteristic wing color patterns, especially that of the underside, and for this reason it can be confused only with the genus *Lucinia*. However, *Lucinia* has two larger wing ocelli, with each covering more of one cell and not connected by any continuous or broken brown band; and the hind wing margin is not rounded. Röber (1916) superficially segregated the species of *Dynamine* into three groups: 1) those with little difference in wing pattern between males and females; 2) those with appreciable difference in the patterning of the sexes and without wing ocelli on the underside; and 3) those that differ in the wing pattern of the sexes and which have wing ocelli.

The genus *Dynamine* is represented in the West

Indies by only two species (*D. egea* Fabricius, 1775 and *D. mylitta* Cramer, 1780), both belonging to group 3. *Dynamine alexae* new species has wing ocelli, but it is unknown whether the sexes were dimorphic and whether the wing uppersides had white spots or bands. *Dynamine mylitta* has a range from Mexico to Argentina including Cuba, and has a wing pattern very different from that of *D. alexae* (the former has a white median band under the forewing divided in three small parts and the anterior ocellus on the hind wing is present in  $CuA_1-CuA_3$ ). *Dynamine egea* has a range from Mexico to Colombia, including Cuba, Hispaniola, and Jamaica, where it purportedly occurs as three subspecies (*D. e. calais*, *D. e. zetes* and *D. e. egea*, respectively). *Dynamine alexae* is much larger than all the West Indies forms (25.80 mm estimated forewing length vs. 21–22 mm; and 18.75 mm greatest hind wing width vs. 12.46 mm; see fig. 4). The broad continuous band that connects the two hind wing ocelli is similar to the band in the extant subspecies *D. egea calais* from Cuba and *D. e. egea* from Jamaica, and different from the subspecies on Hispaniola that has a narrow, occasionally broken, brown band (fig. 4). In general, the wing color pattern of *D. alexae* is similar to that of *D. egea* on the continent and the West Indies.

The species of *Dynamine* possessing two ocelli that are not present in the West Indies are: *D. ate*, *D. artemisia*, *D. onias*, *D. glauca*, *D. meridionalis*, *D. agatha*, *D. pebana*, *D. aerata*, *D. paulina*, *D. perpetua*, *D. gisella*, and *D. zenobia* (for wing pattern and other characteristics of these species, see D'Abrera, 1987). *Dynamine alexae* differs from all of these species in some characters, most obviously in a size significantly larger than that of the first seven species listed. Butterflies in the genus *Dynamine* are all small-sized (FW length from 13 to 28 mm approx.) and, for this range *D. alexae* (FW length = 25.80 mm) equals in size the largest specimens of the largest continental species (e.g., *D. hoppi gillotti* with a range of FW length from 26 to 28 mm, or *D. hecuba* from 22 to 24 mm). Furthermore, *D. alexae* n.sp. has a very broad hind wing compared to the greatest width of its forewing. In extant *Dynamine* species the greatest width is identical in both wings or even larger in the forewing. In addition, *Dynamine aerata* has the posterior wing ocellus larger than the anterior one. *Dynamine paulina* has a very large anterior ocellus that extends over three cells, and the white median band on the underside of the forewing is divided into three small parts (fig. 4). *Dynamine perpetua*, *D. gisella*, and *D. zenobia* have a very small, costal, white subband on the fore wing in comparison

## PEÑALVER AND GRIMALDI: MIOCENE AMBER BUTTERFLIES

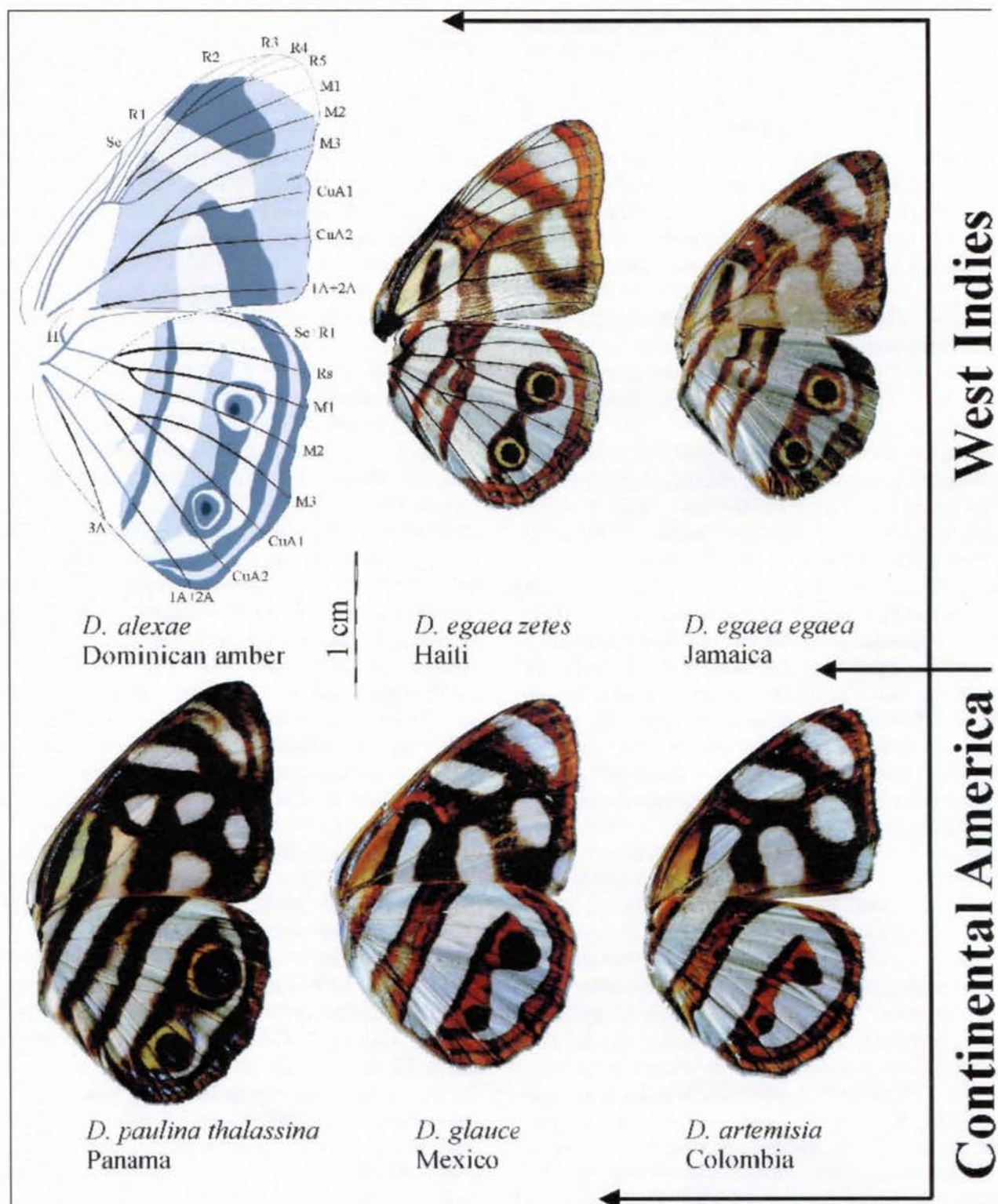


Fig. 4. Fossil and Recent wing venations and underside color patterns in males of the genus *Dynamine*. The reconstruction of the underside color pattern of *Dynamine alexae* n.sp. is adapted from several Recent species of *Dynamine* (fig. 3. shows the partly preserved color pattern), and the reconstruction of the wing venation (depicted as gray lines) is adapted from the venation of *D. egea zetes* from Hispaniola. All specimens are from the AMNH collection. All to same scale.



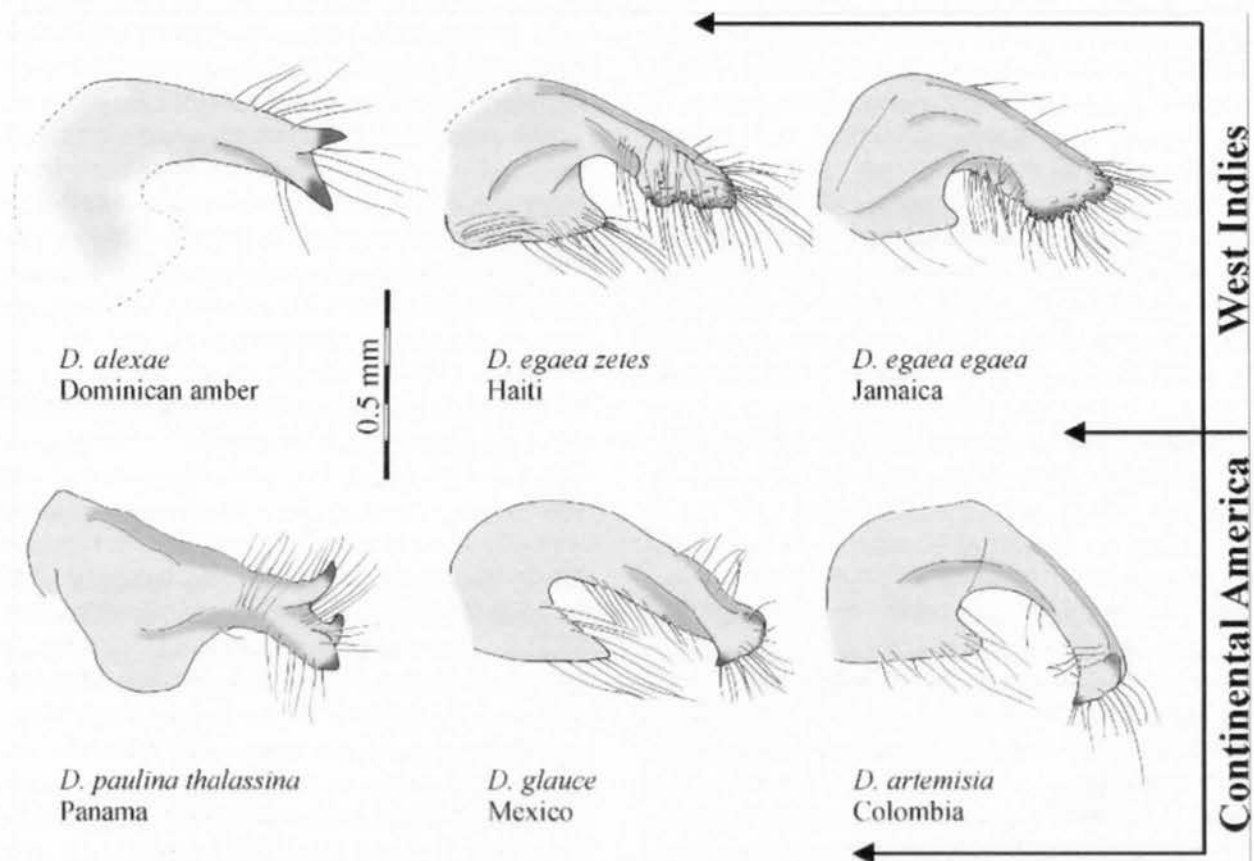


Fig. 5. Male genitalic valves of fossil and Recent species of *Dynamine*. All specimens are from the AMNH collection. All to same scale.

with *D. alexae*.

The male valves in extant *Dynamine* vary greatly in form. We have compared the valves of *D. alexae* n.sp. with four species (fig. 5), which differ most in the structure of the apex. The two "subspecies" of *D. egea* that were studied from the West Indies have a broad, granulate apex without spines. The continental "subspecies" *D. paulina thalassina* has three strong, short spines (one dorsal and two ventral) in the apex. Lastly, the continental *D. glauce* and *D. artemisia* have two small apical spines.

#### TAPHONOMY

Amber in general preserves insects and other organisms that are uncommon in the fossil record (e.g., Lewis and Grimaldi, 1997), and many specimens are unique, like the nymphalid described here. Normally, the inclusions are small, and on occasion there are preserved large insects like butterflies (Grimaldi, 1996; Grimaldi and Engel, 2005), but most butterflies and moths in amber are small, rarely larger than one

centimeter (Weitschat and Wichard, 2002). Small vertebrates, including the remains of mammals, amphibians, and reptiles, have been also found (e.g., Rieppel, 1980; Poinar and Cannatella, 1987; Grimaldi, 1996; MacPhee and Grimaldi, 1996). This indicates voluminous production and exudation of resin by extinct species of *Hymenaea* during the Miocene, just as occurs with living species of the genus when wounded by storms or boring insects (Langenheim, 2003). There is also evidence that the Tertiary resin was very fluid. The wing surfaces of butterflies easily repel most fluids and are very resistant to wetting, due to the vestiture of imbricate scales. Thus, only a very fluid resin could penetrate such surfaces completely and permit thorough fossilization. The nymphalid specimen has numerous gas bubbles trapped on the wing surfaces, due to the apparently original resistance against the fluids, but the rionidid specimen has no bubbles. Possibly, the scarce record of butterflies in Tertiary ambers is a consequence of a bias against the preservation of large insects, a hypothesis that agrees with the more abundant Tertiary amber record of moths. Moths and butterflies are rarely fossilized in lacustrine deposits perhaps because their

## PEÑALVER AND GRIMALDI: MIOCENE AMBER BUTTERFLIES

broad, scaly wings resist wetting (Martínez-Delclòs et al., 2004).

Wing color patterns are commonly fossilized in both main types of Konservat-Lagerstätten in the insect fossil record, including laminated carbonates and amber. These color patterns have a chemical (pigments) or a physical (e.g., diffractive) origin. Chemical color pattern is preserved in laminated rocks due to anoxic conditions in the bottom of some aquatic environments (Martínez-Delclòs et al., 2004). Fidelity in amber also includes chemical color patterns, surely due also to the anoxic conditions inside resin, but also to the complex mixture of terpenes and other hydrocarbons.

The genus *Dynamine* is generally recognized by their metallic markings, either on the hindwing underside or on the upper side of both wings (DeVries, 1987), but these markings are preserved in amber as brown spots, not the original metallic optical effect. Some scales in the *Dynamine* specimen preserve the original color; for example, on the ventral part of both the abdomen and tibiae are scales that are preserved with their original white color. These white scales are not a taphonomic alteration since such scales are present precisely on the white abdominal and leg parts of extant *Dynamine*.

Hall et al. (2004) indicated that the five known adults of *Voltinia damba* are females, and that caterpillars of Recent species of the subtribe Napaeina feed exclusively on the leaves of epiphytic plants (DeVries, 1997), and thus presumably near resin production in *Hymenaea* trees where the females oviposited. Subsequently, Vane-Wright (2004) agreed that this record of five females is not a random phenomenon. The new female specimen in the AMNH collection supports this hypothesis of taphonomic bias in the preservation of females. Members of the genus *Dynamine* are essentially forest butterflies and the extant subspecies *D. egea zetes* in Hispaniola has the habit of congregating around trees of different species (Schwartz, 1989). This habit presumably facilitated the entrapment of *Dynamine alexae* in resin.

## PALEOECOLOGY

Hall et al. (2004) indicated that caterpillars of *V. damba* possibly fed on the leaves of epiphytic Bromeliaceae and Orchidaceae, because this species belongs to a group of genera whose larvae feed on these plants (DeVries et al., 1994). There are other groups of insects found in Dominican amber that today are associated with Bromeliaceae and Orchidaceae, such as stalk-winged damselflies and orchid bees (Engel, 1999),

and, in addition, some plant remains found in this amber could belong to orchids and indeterminate epiphytes (Poinar and Poinar, 1999). Minute bromeliads do occur in Dominican amber (AMNH collection).

The caterpillars of extant *Dynamine* are specialist feeders on flowers or bracts and developing leaves of the genera *Tragia* and *Dalechampia* in Euphorbiaceae (Brown and Heineman, 1972; DeVries, 1987). Schwartz (1989) observed *D. egea zetes* adults in Hispaniola feeding on the flowers *Daucus* sp. (Apiaceae) and on *Lantana ovatifolia* (Verbenaceae), and Alayo and Hernández (1987) cited that caterpillars of *D. e. calais* can feed on *Tragia urens* (Euphorbiaceae). Indeed, the adults of *Dynamine* are generally uncommon except around *Dalechampia*. In several sites in Ecuador where two or three species of *Dynamine* are encountered (typically along streams and rivers), nine species were attracted to spots where potted *Dalechampia* plants were placed in forest gaps (P. J. DeVries, personal commun. 2005). Dominican amber contains abundant plant remains (including myriad flowers), but the plants are very poorly studied, so it is not surprising that *Dalechampia* is as yet unrecorded from this amber. Poinar and Poinar (1999) cited the families Euphorbiaceae and Urticaceae in this amber, and there is a euphorb flower in the AMNH collection. According to a paleobiogeographic scenario proposed for *Dalechampia* (Ambruster, 1994), it is probable that this important host plant genus for *Dynamine* lived during the Miocene in Hispaniola. Extant *Dalechampia* need resin-collecting bees for its pollination, and such bees (Meliponini: Proplebeia) are common in Dominican amber (Camargo et al., 2000). Lastly, the extant caterpillars of *Theope*, the other butterfly genus present in Dominican amber, feed on a wide group of plant families, which are: Sterculiaceae, Fabaceae, Bombacaceae, Cecropiaceae, Lecythidaceae, Euphorbiaceae, Convolvulaceae, and Cochlospermaceae (DeVries, 1997).

## PALEOBIOGEOGRAPHY

The fossil butterflies in Dominican amber indicate there was significant extinction in the Antillean fauna, to which we can add another example, *Dynamine*.

The family Riodinidae is poorly represented in the Antilles, as there is presently only one Recent riodinid species, of the genus *Dianesia* (Cuba and the Bahamas). Thus the genera *Voltinia* and *Theope*, both with fossil specimens in Dominican amber, have no species in the Greater Antilles today. *Voltinia* has nine living species

on the Neotropical mainland; *Theope* is widely distributed in the Neotropics from Mexico, through Central America to northwestern Peru, throughout the Guianas to southeastern Brazil and Paraguay, and along the eastern slope of the Andes as far south as northern Argentina (Hall, 1999), including some islands. More than half of all named species of *Theope* are thought to occur only in the Amazon Basin (DeVries, 1997).

Many of the 70 species of nymphalids in the West Indies are endemic, sometimes to a single island; biogeographically there are species with Neotropical and Nearctic affinities and others with relatives on the African continent (Smith et al., 1994). There are about 30 species of *Dynamine* from the southern United States throughout Central and South America, and the greatest species diversity is in the Amazon Basin; some species are extremely restricted (DeVries, 1987). Central America contains 14 species and there are two species in the Antilles (*D. egea* and *D. mylitta*), both of which are also well represented on the continent (each from Mexico to Paraguay-Argentina). According to Miller and Miller (1989) the *Dynamine* species in the West Indies are most closely related to those of Mexico and Central America, like most of the butterflies of the Greater Antilles. These authors further consider *Dynamine* to be good dispersers. Of the 36 species of nymphalids on Hispaniola, only one of them is in the genus *Dynamine*, specifically *D. egea* (subspecies *D. e. zetes*), which is very similar to the Cuban subspecies *D. e. calais*. The subspecies *D. egea dyonis*, occurring in Central America, more closely resembles the Jamaican subspecies *D. e. egea* than the other two Antillean forms, and this has been attributed to the more recent separation of Jamaica from the Yucatán than for the other islands where this species occurs (Smith et al., 1994). We consider a vicariant model for the Jamaican subspecies implausible, given such subtle differences between it and the mainland populations, and the millions of years of geological separation of these landmasses. *Dynamine mylitta* from Cuba and from the continent are identical, suggesting that they reached the island by dispersal, in contrast to the proposed vicariant distribution and subsequent divergence of island populations of *D. egea*.

Miller and Miller (1989) reviewed theories and models for the biogeography of West Indian butterflies, indicating that historically these were dispersalist models. In contrast, Miller and Miller (op. cit.) proposed a combination vicariance/dispersal model, with emphasis on vicariance based on new geological evidence. These authors indicated that it is necessary to

analyze the fossil record in order to determine the ages of butterflies, but only a few fossils were available. After study of the rioidinid fossils, Hall et al. (2004) proposed that the rarity of Rioidinidae in the Antilles today can be attributed to two primary factors; these butterflies are: 1) poorly dispersed over water, and 2) "disproportionately subject to Tertiary extinctions." Exactly what the "Tertiary extinctions" are is unclear, but presumably includes extinctions due to the insularization of Antillean land masses (there is, actually, one more possibility: that rioidinids disperse well but do not colonize well). The finding by Hall et al. (2004) that *Voltinia dramba* is closely related to *V. danforthi* from northwestern Mexico actually contradicts the suggestion that a "probable cause" for the genus becoming extinct in the Antilles is xerophytization from Plio-Pleistocene cooling. *Voltinia danforthi* occurs in the xerophytic states of Sinaloa and Sonora.

We find it most likely that *Voltinia*'s distribution in nuclear America included the Greater Antilles when these islands were closer to or actually fused with the mainland, perhaps in the Early Miocene or Late Oligocene. As the islands became more isolated through drift and/or rising sea levels, *Voltinia* and scores of other arthropod groups became extinct on the Antilles. Perhaps the best reflection of this is seen in the meliponine bees (Apidae: Meliponini). With the exception of a species living in Cuba that might have been introduced, no meliponines occur in the Antilles, even on the large islands of Trinidad and Tobago close to Venezuela. Meliponines are notoriously poor dispersers, particularly over water, and opposite sides of the Amazon River are known to harbor different meliponine faunas (C.D. Michener to D.G. personal commun.). Yet meliponines were in the Antilles. There are three known species of the extinct genus of stingless bees *Proplebeia* in Dominican amber (Camargo et al., 2000), whose presence probably reflects a time when Hispaniola was close to the Central American mainland or after they had recently separated. If Hispaniola was directly connected to Central America when Dominican amber was being formed, we suspect the fossil meliponine fauna would be more reflective of continental diversity. We agree with Hall et al. (2004) that the poor dispersal ability (and possibly a poor colonization ability) keeps rioidinids virtually nonexistent in the Antilles today, but their extinction from that region was probably due to the same reason why island faunas are generally depauperate.



## PEÑALVER AND GRIMALDI: MIOCENE AMBER BUTTERFLIES

COMMENTS ON THE AGE  
OF BUTTERFLIES

The age of butterflies is becoming a contentious issue. Some entomologists maintain that butterflies evolved in the Cretaceous (e.g., Miller, 1987; Miller and Miller, 1997; Vilorio, 1998; Hall et al., 2004; Braby et al., 2005 [see also the citations given therein]). Others maintain that butterflies evolved largely or wholly in the Tertiary (Shapiro, 1994; De Jong, 2003; Vane-Wright, 2004; Grimaldi and Engel, 2005), in approximately half the time of the other estimates.

Hall et al. (2004) supported a Cretaceous origin and divergence for butterflies on the basis of their study of the *Voltinia* fossil in Dominican amber. Assuming that the extinct *Voltinia dromba* and living *V. danforthi* diverged as a result of Caribbean separation from the Central American mainland, they estimated a divergence date of 40–50 million years. First, it is not at all apparent that this divergence coincided with island-mainland drift, even if a geological divergence took place 40–50 mya. It is possible that *V. dromba* colonized Hispaniola just prior to the time in the Miocene when the amber was formed, either through long-range dispersal or across narrow water gaps during periods of low sea level. Even more obvious, though, is that an Eocene divergence date for these two species is implausibly old. Insects preserved in Eocene Baltic amber, for example, are generally very primitive compared to living genera (Weitschat and Wichard, 2002; Grimaldi and Engel, 2005). Using the 40–50 mya divergence date, Hall et al. (2004) concluded that this provided “additional support for a Gondwanan origin of many butterfly tribes and subfamilies,” citing Miller and Miller (1997) and Vilorio (1998), but to which they could apparently now add Braby et al. (2005). All of these authors contend that butterflies evolved as residents of wandering Gondwanan continents, and since Gondwana separated in the Cretaceous, butterflies are at least this old.

The study by Braby et al. (2005) was based on a comprehensive phylogenetic analysis of three genes and the genera of troidine swallowtails (family Papilionidae), which includes the famous bird wing swallowtails. The distribution pattern of troidines in their study appears to be compelling evidence for a Gondwanan distribution. The classic Gondwanan distribution comprises the southernmost, cool temperate forests of Africa, Chile, southeast Australia (including Tasmania), and New Zealand (reviewed in Grimaldi and Engel, 2005). However, no troidines occur in the temperate Austral region. In fact, the areas of endemism

defined for each troidine genus by Braby et al. (2005) are unusually widespread, some of which are not even Gondwanan. The lineage that includes *Troides* and *Ornithoptera*, for example, extends from southeast Asia to the Solomon Islands, New Guinea, and northern Australia, but which they referred to as “Australia”. Likewise, *Parides*, which is widespread throughout Central and South America, is referred to as “South America”. Another difficulty with the Braby et al. (2005) study is that they used the known ages of landmass separation to calibrate their estimates of taxon divergence, which is circular reasoning if one is testing whether taxa are Cretaceous in age. A third difficulty is that molecular estimates of divergence dates are usually considerably older than evidence based on the phylogenetic study of fossils (Rodríguez-Trelles et al., 2002), but they can also give an illusion of precision (Graur and Martin, 2004). Also, there are Recent insect taxa that show classic austral disjunction, like certain chironomid midges, scolytine and megalyrid wasps, primitive cyclorrhaphan flies, and others, but for which fossils of many occur in the Northern Hemisphere (Grimaldi and Engel, 2005), indicating formerly widespread distributions. Even if the biogeographic pattern of troidines was compellingly Gondwanan, which we maintain it is not, fossils in general remind us to be cautious about interpreting historical distributions entirely on the basis of the Recent fauna.

Lastly, Braby et al. (2005) make the typical appeal of incompleteness of the fossil record to support their hypothesis of Cretaceous butterflies, namely that Cretaceous butterflies have not been discovered given their rarity.

The fossil record of Papilionoidea, in fact, is quite good among macrolepidopterans. There are approximately 33 named fossil butterflies—more than any other group of macrolepidopterans—and all of them are Tertiary (reviewed in Grimaldi and Engel, 2005). This fact, plus the relatively derived phylogenetic position of butterflies among Ditrysia, makes it unlikely that they are much older than latest Cretaceous. If, according to Braby et al. (2005), troidine swallowtails existed by 90 mya, then the Papilionidae would need to have existed earlier than this, say 100 mya. In this scenario, Rhopalocera (including skippers and Hedyliidae) would need to be older still (say 120–130 mya), and Macrolepidoptera and Ditrysia origins would need to have originated in the Jurassic. This scenario defies all fossil evidence. Only small, primitive lepidopterans are known from the Late Jurassic and Early Cretaceous, and only one possible ditrysian (a leaf mine of an apparent gracillarioid) is known from the

Cretaceous (reviewed in Grimaldi and Engel, 2005). It is highly implausible that 80 million years of macrolepidopterans have simply escaped notice.

Tertiary evolution of the butterflies could easily be falsified by the discovery of a Cretaceous specimen, but for the time being we contend that Vane-Wright (2004: 408) was entirely right in saying there is "no existing evidence to suggest that butterflies are older than about 70 million years."

#### ACKNOWLEDGMENTS

We appreciate the scientific advice of James S. Miller (AMNH) and Adrián Tejedor (AMNH), the generosity of Keith Luzzi and Susan Hendrickson in providing the specimens for the AMNH, as well as the advice and review by P.J. DeVries and an anonymous reviewer. This research is a contribution to the junior author's postdoctoral project "Taphonomy and paleoecology of insects in Dominican amber" thanks to a grant financed by the "Secretaría de Estado de Educación y Universidades" of the Spanish government and the European Social Fund.

#### REFERENCES

- Ackery, P.R., R. De Jong, and R.I. Vane-Wright. 1999. The butterflies: Hedyloidea, Hesperioidea and Papilionidea. In N.P. Kristensen (editor), *Handbuch der Zoologie: Eine Naturgeschichte der Stämme des Tierreiches: Band IV: Arthropoda: Insecta: Teilband 35: Lepidoptera, moths and butterflies: Volume 1: Evolution, systematics, and biogeography*: 263–300. Berlin: Walter de Gruyter.
- Alayo, P.D., and L.R. Hernández. 1987. *Atlas de las mariposas diurnas de Cuba (Lepidoptera: Rhopalocera)*. La Habana: Editorial Científico-Técnica.
- Armbruster, W.S. 1994. Early evolution of *Dalechampia* (Euphorbiaceae): insights from phylogeny, biogeography, and comparative ecology. *Annals of the Missouri Botanical Garden* 81: 302–316.
- Braby, M.F., J.W.H. Trueman, and R. Eastwood. 2005. When and where did troidine butterflies (Lepidoptera: Papilionidae) evolve? Phylogenetic and biogeographic evidence suggests an origin in remnant Gondwana in the Late Cretaceous. *Invertebrate Systematics* 19: 113–143.
- Brakefield, P.M., and V. French. 1999. Butterfly wings: the evolution of development of colour patterns. *BioEssays* 21: 391–401.
- Brower, A.V.Z. 2000. Phylogenetic relationships among the Nymphalidae (Lepidoptera), inferred from partial sequences of the wingless gene. *Proceedings of the Royal Society of London B* 267: 1201–1211.
- Brown, F.M., and B. Heineman. 1972. *Jamaica and its butterflies*. London: E.W. Classey.
- Camargo, J.M.F., D.A. Grimaldi, and S.R.M. Pedro. 2000. The extinct fauna of stingless bees (Hymenoptera: Apidae: Meliponini) in Dominican amber: two new species and redescription of the male of *Proplebeia dominicana* (Wille and Chandler). *American Museum Novitates* 3293: 1–24.
- Cramer, P. 1780. *Papillons exotiques des trois parties du monde l'Asie, l'Afrique et l'Amérique rassemblés et décrits par M. Pierre Cramer, dessinés sur les originaux, gravés et enlumines sous sa direction*. *Uitlandsche Kapellen* 3(22): 1–176.
- D'Abrera, B. 1987. *Butterflies of the Neotropical region, Part IV, Nymphalidae (Partim)*: 528–678. Victoria: Hill House Publishers.
- De Jong, R. 2003. Are there butterflies with Gondwanan ancestry in the Australian region? *Invertebrate Systematics* 17: 143–156.
- De Jong, R., R.I. Vane-Wright, and P.R. Ackery. 1996. The higher classification of butterflies (Lepidoptera): problems and prospects. *Entomologica Scandinavica* 27: 65–101.
- DeVries, P.J. 1987. *The butterflies of Costa Rica and their natural history. Papilionidae, Pieridae, Nymphalidae*. Princeton, NJ: Princeton University Press.
- DeVries, P.J. 1997. *The butterflies of Costa Rica and their natural history, Volume II, Riodinidae*. Princeton: Princeton University Press.
- DeVries, P.J., I.A. Chacón, and D. Murray. 1994. Toward a better understanding of host use and biodiversity in riodinid butterflies (Lepidoptera). *Journal of Research on the Lepidoptera* 31: 103–126.
- DeVries, P.J., and G.O. Poinar. 1997. Ancient butterfly-ant symbiosis: direct evidence from Dominican amber. *Proceeding of the Royal Society of London B* 264: 1137–1140.
- Engel, M.S. 1999. The first fossil *Euglossa* and phylogeny of the orchid bees (Hymenoptera: Apidae: Euglossini). *American Museum Novitates* 3272: 1–14.
- Freitas, A.V.L., and K.S. Brown. 2004. Phylogeny of the Nymphalidae (Lepidoptera). *Systematic Biology*

## PEÑALVER AND GRIMALDI: MIOCENE AMBER BUTTERFLIES

- 53(3): 363–383.
- Graur, D., and W. Martin. 2004. Reading the entrails of chickens: molecular timescales of evolution and the illusion of precision. *Trends in Genetics* 20: 80–86.
- Grimaldi, D.A. 1995. The age of Dominican amber. In K.B. Anderson and J.C. Crelling (editors), *Amber, resinite, and fossil resins*. Washington D.C.: American Chemical Society Symposium Series 617: 203–217.
- Grimaldi, D.A. 1996. *Amber: window to the past*. New York: AMNH/Abrams.
- Grimaldi, D.A., E. Bonwich, M. Delannoy, and S. Doberstein. 1994. Electron microscopic studies of mummified tissues in amber fossils. *American Museum Novitates* 3097: 1–31.
- Grimaldi, D.A., and M.S. Engel. 2005. *Evolution of the insects*. New York: Cambridge University Press.
- Hall, J.P.W. 1998. A review of the genus *Sarota* (Lepidoptera: Riodinidae). *Tropical Lepidoptera* 9(suppl. 1): 1–21.
- Hall, J.P.W. 1999. A revision of the Genus *Theope*. Its systematics and biology (Lepidoptera: Riodinidae: Nymphidiini). Gainesville, FL: Scientific Publishers.
- Hall, J.P.W. 2003. Phylogenetic reassessment of the five forewing radial-veined tribes of Riodininae (Lepidoptera: Riodinidae). *Systematic Entomology* 28: 23–37.
- Hall, J.P.W., and D.J. Harvey. 2002. A survey of androconial organs in the Riodinidae (Lepidoptera). *Zoological Journal of the Linnean Society* 136: 171–197.
- Hall, J.P.W., R.K. Robbins, and D. Harvey. 2004. Extinction and biogeography in the Caribbean: new evidence from a fossil riodinid butterfly in Dominican amber. *Proceedings of the Royal Society of London B*, 03PB1031: 5 pp.
- Hammond, P.C., and G.O. Poinar. 1998. A larval brush-footed butterfly (Lepidoptera: Nymphalidae) in Dominican amber, with a summary of fossil Nymphalidae. *Entomologica Scandinavica* 29: 275–279.
- Harvey, D.J. 1987. The higher classification of the Riodinidae (Lepidoptera). Ph.D. dissertation, University of Texas, Austin.
- Henwood, A. 1992a. Exceptional preservation of dipteran flight muscle and the taphonomy of insects in amber. *Palaos* 7: 203–212.
- Henwood, A. 1992b. Soft-part preservation of beetles in Tertiary amber from the Dominican Republic. *Palaeontology* 35: 901–912.
- Iturralde-Vinent, M.A., and R.D.E. MacPhee. 1996. Age and paleogeographical origin of Dominican amber. *Science* 273: 1850–1852.
- Kristensen, N.P. 1976. Remarks on the family-level phylogeny of butterflies (Insecta, Lepidoptera, Rhopalocera). *Zeitschrift für Zoologische Systematik und Evolutionsforschung* 14: 25–33.
- Kristensen, N.P., and A.W. Skalski. 1999. Palaeontology and phylogeny. In N.P. Kristensen (editor), *Handbuch der Zoologie: Eine Naturgeschichte der Stämme des Tierreiches: Band IV: Arthropoda: Insecta: Teilband 35: Lepidoptera, moths and butterflies: Volume 1: Evolution, systematics, and biogeography: 7–25*. Berlin: Walter de Gruyter.
- Langenheim, J.H. 2003. *Plant resins. Chemistry, evolution, ecology, and ethnobotany*. Portland-Cambridge: Timber Press.
- Lewis, R.E., and D.A. Grimaldi. 1997. A pulicid flea in Miocene amber from the Dominican Republic (Insecta: Siphonaptera: Pulicidae). *American Museum Novitates* 3205: 1–9.
- MacPhee, R.D.E., and D.A. Grimaldi. 1996. Mammal bones in Dominican amber. *Nature* 380: 489–490.
- Martínez-Delclòs, X., D.E.G. Briggs, and E. Peñalver. 2004. Taphonomy of insects in carbonates and amber. *Palaeogeography, Palaeoclimatology, Palaeoecology* 203: 19–64.
- Miller, J.S. 1987. Phylogenetic studies in the Papilioninae (Lepidoptera: Papilionidae). *Bulletin of the American Museum of Natural History* 186: 365–512.
- Miller, L.D., and J.Y. Miller. 1989. The biogeography of West Indian butterflies (Lepidoptera: Papilionoidea, Hesperioidea): a vicariance model. In Ch.A. Woods and F.E. Sergile (editors), *Biogeography of the West Indies: 229–262*. Gainesville, FL: Sandhill Crane Press.
- Miller, L.D., and J.Y. Miller. 1997. Gondwanan butterflies: the Africa-South America connection. *Metamorphosis* 3(suppl.): 42–51.
- Oppler, P.A., and A.D. Warren. 2003. Butterflies of North America 2. Scientific names list of butterfly species of North America, north of Mexico. Contributions of the C.P. Gillette Museum of Arthropod Diversity, Colorado State University: 1–80.
- Poinar, G.O. 1992. *Life in amber*. Palo Alto, CA: Stanford University Press.
- Poinar, G.O., and J.W. Brown. 1993. A new fossil tortricid (Lepidoptera: Tortricidae) from Dominican amber. *Entomologica Scandinavica* 23: 25–29.
- Poinar, G.O., and D.C. Cannatella. 1987. An Upper Eocene frog from the Dominican Republic and its



- implications for Caribbean biogeography. *Science* 237: 1215–1216.
- Poinar, G.O., and R. Poinar. 1999. *The amber forest. A reconstruction of a vanished world.* Princeton, NJ: Princeton University Press.
- Rieppel, O. 1980. Green anole in Dominican amber. *Nature* 286: 486–487.
- Röber, J. 1916. “*Dynamine*”. In A. Seitz (editor), *Macrolepidoptera of the world* 5: 504–508. Stuttgart: Alfred Kernen.
- Rodríguez-Trelles, F., R. Tarrío, and F.J. Ayala. 2002. A methodological bias toward overestimation of molecular evolutionary time scales. *Proceedings of the National Academy of Sciences, USA* 99: 1812–1815.
- Schwartz, A. 1989. *The butterflies of Hispaniola.* Gainesville, FL: University of Florida Press.
- Scudder, S.H. 1875. Historical sketch of the generic names proposed for butterflies. *Proceedings of the American Academy of Arts and Sciences* 10: 91–203.
- Shapiro, A.M. 1994. Why are there so few butterflies in the high Andes? *Journal of Research on the Lepidoptera* 31: 25–56.
- Smith, D.S., L.D. Miller, and J.Y. Miller. 1994. *The butterflies of the West Indies and South Florida.* Oxford: Oxford University Press.
- Vane-Wright, D. 2004. Butterflies at that awkward age. *Nature* 428: 477–480.
- Voloria, A.L. 1998. *Studies on the systematics and biogeography of some montane satyrid butterflies (Lepidoptera).* Ph.D. dissertation, King's College, London.
- Wahlberg, N., E. Weingartner, and S. Nylin. 2003. Towards a better understanding of the higher systematics of Nymphalidae (Lepidoptera: Papilionoidea). *Molecular Phylogenetics and Evolution* 28(3): 473–484.
- Weitschat, W., and W. Wichard. 2002. *Atlas of plants and animals in Baltic amber.* Munich: Verlag Dr. Friedrich Pfeil.
- Wier, A., M. Dolan, D.A. Grimaldi, R. Guerrero, J. Wagensburg, and L. Margulis. 2002. Spirochete and protist symbionts of a termite (*Mastotermes electrodominicus*) in Miocene amber. *Proceedings of the National Academy of Sciences, USA* 99: 1410–1413.

This paper meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper). Complete lists of all issues of the *Novitates* and the *Bulletin* are available at World Wide Web site <http://library.amnh.org/pubs>. Inquire about ordering printed copies via e-mail from [scipubs@amnh.org](mailto:scipubs@amnh.org) or via standard mail from: American Museum of Natural History, Library—Scientific Publications, Central Park West at 79th St., New York, NY 10024. TEL: (212) 769-5545. FAX: (212) 769-5009.

\*\*\*\*\*

## ANOTHER GREAT TAUNT AND INSULT FROM A WELL-KNOWN HISTORICAL FIGURE

*“He is not only dull himself, he is the cause of dullness in others.”*

Samuel Johnson (September 18, 1709 - December 13, 1784) often referred to simply as Dr. Johnson, was one of England's greatest literary figures: a poet, essayist, biographer, lexicographer and often considered the finest critic of English literature. He was also a great wit and prose stylist whose *bons mots* are still frequently quoted in print today. Between 1747 and 1755, Johnson wrote perhaps his best-known work, *“A Dictionary of the English Language”*. [From Wikipedia, the free encyclopedia]

\*\*\*\*\*

## EVEN MORE LESSONS FROM A YOGI

*“I usually take a two hour nap from 1 to 4.”*

*“Never answer an anonymous letter.”*

NEW HOST PLANT RECORD FOR *EUPHYES BERRYI*BY  
DAVID FINE

*Euphyes berryi* has become a very elusive and difficult butterfly to locate in the state of Florida. It was once reported in many locations in many different counties in this state. I have found, however, that despite all of the records and reports that I have heard over the past few years on where to locate this butterfly, it seems that nobody can tell me where and when I can go and expect to actually see a specimen of *Euphyes berryi*. As we Lepidopterists do, I went to every book that I could find, hoping to get an idea what this butterfly eats and in which specific habitat they thrive that might help me locate it. I have found little assistance in any of the available books, field guides and web sites that is applicable in the field. The information given about this butterfly is consistently general in nature.

I found the following descriptions of habitat and larval food of *Euphyes berryi* in several well known publications. "Habitat: wetlands, flat woods, pine savannas, and margins of swamps." "Natural History: Very local in distribution. May be common where it does occur..." "Found throughout Florida, except for the Keys." "Host Plants: Sedges (family Cyperaceae) Undetermined *Carex* species." Page 157, (M. C. Minno, J. F. Butler, and D. W. Hall. 2005, *Florida Butterfly Caterpillars and Their Host Plants*, University of Florida Press, Gainesville, Florida). Also, this butterfly is "Rare and Local in the southeast." Habitat is "Pond edges, swamps, and other wet habitats." "Larval Food Plant: Sedges" Page 334, (J.P. Brock, K. Kaufman, 2003, *Butterflies of North America*, Kaufman Focus Guides, Hillstar Editions L.C.). Finally, "Habitat subtropical to southern coastal-plain marshy sedge areas" Page 456 (J.A. Scott, 1992, *The Butterflies of North America, A Natural History and Field Guide*, Stanford University Press, Stanford, California). All three of these books have been a tremendous help to me in recent times, however, none of them could really help me find *Euphyes berryi*, nor could any information given on any web-site I could find when I ran "*Euphyes berryi*" through a Google search.

I made it a personal goal to find out as much as I could about this rare beast. My first encounter with *Euphyes berryi* in the field was an accidental one. I was thrilled in late February of 2000 to be collecting *Euphyes pilatka*. Leroy Koehn told me where to go to collect them in numbers. There is a thistle stand on the west side of the road on Krome Avenue 1 mile north of Tamiami Trail. To the west of the road is a small marshy area with lots of different grasses and sedges including sawgrass. That day was the first day that I had ever seen *Euphyes pilatka* and there were enough of them to keep me occupied for a few hours along with a dozen or so other Hesperiid species. It wasn't until I got my specimens home and began to mount them when I realized that one of my *E. pilatka* wasn't *E. pilatka*. It was a fairly worn *Euphyes berryi* male.

The following weekend, I took a journey to Collier County with hopes to find similar habitats that I might have an easier time finding this "needle in a hay stack". Jeff Slotten and Leroy Koehn both sent me to the same place. They both had remembered encountering *Euphyes berryi* along with other interesting bugs like *Didesys belae* and the South Florida form of *Papilio troilus (ilioneus)* sipping on thistles on route 839 just North of US 41 (Tamiami Trail). It had been a good 10 years or so since either of them had collected there and although the habitat had not changed, the availability to swing a net sure did. While driving to where "the pro's" sent me, I came to realize that this site was now owned by the State of Florida and is right smack in the middle of Big Cypress Preserve. Between Big Cypress, Everglades National Park and Fakahatchee Strand State Preserve, someone wishing to swing a net finds themselves dancing and dodging these lines.

On March 3<sup>rd</sup>, of 2000, Mark Walker and I took a Photography/Collecting trip to South West Florida in search of a variety of butterflies including *Euphyes berryi*. We first drove up route 839 from "Wagon Wheel Road" and found this habitat teeming with wildlife. The small canal that parallels the small dirt road is loaded with alligators, fishes of all kinds, and a vast display of wading birds like the wood stork and the blue heron. Birds of prey are also a common site including a red tailed hawk we saw feasting on snake of sorts in a cypress tree just 20 meters away on the other side of the canal. We came face to face with a cotton mouth or "water moccasin" while looking for butterflies. By the time we saw it, the snake had already cocked back into its "intimidation posture" displaying its fangs and white flesh on the inside of its mouth from which it got its name. Just up the way, a very large owl startled us as it flew from its perch just a few feet over our heads. These animals along with the fantastic Lepidoptera fauna make for a photographer's paradise! The alligators also know the sight of a bent

fishing rod as well as I found out on another trip that had inclement weather for observing butterflies. The beasts leave you alone until they see your rod bent with the fighting action of a fish. All of a sudden, it's like a dinner bell was rung and they creep their way right over to you and make their way up onto the bank once you pull the fish in. It didn't take long to see that people ignore warnings not to feed them. It's obvious that they are used to people getting a kick out of throwing them their catch.

At this time of year the thistles are in full bloom and the skipper variety is tremendous. It didn't take long to see my fist *Euphyes berryi*. You do have to sift through the hoards of other skippers like *Euphyes pilatka*, *Asbolis capucinus*, *Euphyes arpa*, and others but the *berryi* are there and they are not uncommon. It took a few hours of looking at skippers before both of us were comfortable identifying them from the rest by looking. We positively identified 9 specimens that day.

The next year on March 2<sup>nd</sup>, 2001, I came out with intent to find other areas near by where we could actually collect some specimens legally outside of park boundaries. I figured that surely there must be some area that has a similar habitat to the one on route 839 that is not protected land. It turned out to be much more difficult than I ever imagined. I drove around all day looking for a similar place or even for some thistle plants and never felt it necessary to step foot outside the car. There was nothing even close! I wound up traveling back to route 839 to get some pictures anyhow. The species seen were impressive as well as the sheer numbers of specimens. Now knowing what I am looking for, I identified 16 specimens of *Euphyes berryi* by myself.

Two years later, John Hayatt called me and told me that he and his wife would be visiting South West Florida for a few days in early March and *Euphyes berryi* was a bug on his list. I told him that I would be happy to try my best to find one for him. We had bad weather on the morning of March 2<sup>nd</sup>, but we gave it our best shot driving up and down the small dirt roads of Collier county looking for a location that might hold this elusive butterfly. After a few hours we both decided to call it quits but we both did at least want to see one so we headed back down to route 839 for some photo opportunities. It wasn't long before we saw upwards of 20 specimens of *Euphyes berryi* along with the typical slew of other Hesperiid species. I then turned my attention to trying to locate a host plant. Knowing that they have been reared on various sedges, I started looking for different kinds of grasses and began looking for tents. There was a rather large sedge growing commonly in clumps fairly close to the road and scattered throughout the marshes. It stuck out from the others because of its light green color and appeared to be flushing out with new, spring-time growth.

I found 4 larval "tents". Two of them had spiders living in them and the other two had emerged Hesperiid pupae. I knew we were on to something. About 10 minutes later, I was privileged enough to witness a female *Euphyes berryi* oviposit on a leaf of this same sedge. I knew now that the pupa shells that I had found were indeed *Euphyes berryi*. Now the search was on to find a pupa that had not emerged yet. It was only minutes later when something caught my eye. I was amazed to see resting on a leaf of the sedge that was part of a larval tent, a spider carrying something with its fangs. After closer observation, I realized that it was a pupa that just had been removed from its tent. I was amazed, yet appalled at the same time. I knew I could not let this photo opportunity pass by so I snapped a few dozen pictures. The spider turned out to be a jumping spider (family *Salticidae*). It was the same species that I kept seeing when I would open a larval tent. It appears that this spider actually hunts down skipper pupae, devours them, and then steals the tent for its own home! I observed 17 tents that day and 6 of them had spiders living in them. Only one contained a viable pupa. Content with our findings John and I said our goodbyes and I headed for the house.

The following year I was determined to find *Euphyes berryi* outside of a park boundary so that I could actually collect some. Visiting the area known as "the squares" on February 25<sup>th</sup>, I drove by a small, low-lying area that had some of the same sedge that I found the skippers on the previous year. After only a few short minutes of searching, I found a viable skipper pupa. It emerged later to be *Euphyes berryi*. I took a sample of the plant home with me to send away for identification. I was also able to collect two female *Euphyes berryi* on near by thistles. I took them home for egg laying. Dr. Dick Weaver at DPI is a grass expert and was kind enough to identify it for me and within minutes of receiving the plant in the mail, he called me to give me the news. The species is (*Rhynchospora inundata*) family *Cyperaceae*. It is one of the most widely spread sedges in Florida and throughout the Southeastern United States. It grows commonly in any low-lying wet area and in marshes, on





A worn *Euphyes berryi* male (more difficult to distinguish than fresh specimens).



*Euphyes arpa* (slightly larger than *E. berryi* with heavy orange scaling on the head and dorsal thorax).



*Euphyes berryi* pupal predator - jumping spider family - Salticid.



*Anatrytone logan* (slightly smaller than *E. berryi*, and lacks light veins).



*Euphyes berryi* adult specimens and pupa (note variations especially in the females).



*Euphyes pilatka* and two *Oligoria maculata* fighting for space.



*Asbolis capucinus* (shouldn't be confused with *E. berryi*).



*Euphyes berryi* eggs.



*Euphyes berryi* larva, 3<sup>rd</sup> instar.





*Polites vibex*, *Oligria maculata* and a fleeing *Euphyes pilatka*.



Flower of *Rhynchospora inundata*.



Fresh *Euphyes berryi* male.



*Euphyes berryi* hostplant (*Rhynchospora inundata*).



Some skippers from Collier county:

*Euphyes pilatka* - top left group,  
*Euphyes arpa* - center left group,  
*Anatrione logan* - bottom left pair,  
*Asbolis capucinus* - bottom right pair,  
*Euphyes berryi* - top right group.



Salticid (jumping spider) carrying *Euphyes berryi* pupa away.



*Rhynchospora inundata* stand.

roadsides and in swamps.

From the two females I was able to obtain 66 eggs. They lay very easily when placed in a small container with a netting top with a small leaf of the host plant. All 66 eggs hatched and fed readily on cuttings of various sedges including young leaves of sawgrass (*Cladium jamaicense*), yellow nut sedge (*Cyperus esculentus*), and purple nut sedge (*Cyperus rotundus*). Larvae took a very long time to mature making feeding difficult when attempting to do cuttings. It took an entire two months to get larvae to the third instar when I began to experience a serious virus problem. I went and found some of the host sedge (*Rhynchospora inundata*) growing in a ditch on the side of the road in Delray Beach where I lived. I potted them up and they took very easily. I placed a few larvae on each of these potted plants and they quickly began to feed. They stayed on the plants for an additional month and my frustration grew larger than the larvae were growing. Five weeks after the larvae were switched onto living plants I was down to five larvae in the fourth instar. Eventually, all but one of them died. But I did get one pupa. Unfortunately, the pupa virused after only one week. While experiencing extreme frustration and not obtaining any freshly emerged specimens, at least I was able to capture the life cycle photographically.

I suspect that the time spent on cuttings deteriorated the health of my culture and there is a possibility of a pesticidal influence. The various sedges that were being fed to the larvae were coming from roadsides and overgrown lawns which are prime locations for mosquito spray and other types of chemicals that would easily cause the larvae to perish.

In conclusion, it is difficult to say why this butterfly struggles to adapt. It certainly is not because of a lack of food plant. I suspect that (*Rhynchospora inundata*) is not the only sedge that *Euphyes berryi* will accept as a host. Where the plant grows in a natural setting in the correct habitat, the butterflies do seem to thrive. This past February, I ventured to route 839 and found 46 *Euphyes berryi* specimens in 3 hours by walking down the road looking at thistles. The butterfly is very commonly found for about two weeks while the thistles are in bloom. After these flowers fall out of bloom, the butterflies are very scarce making it hard to believe that they even exist in this environment at all. The butterfly life remains active with various swallowtails flying about, *Phoebis sennae* and *Phoebis philea* as well. *Danaus gilippus* is always in numbers. *Neonympha areolata* and *Calephelis virginensis* are also easily scared up out of the grasses. The skippers however seem to vanish appearing only as a small brown streak zipping across the road at 40 miles an hour. At times they can be seen sunning themselves in the A.M. hours and can be seen sipping nectar from *Bidens alba* occasionally. Adults disperse back into the endless sea of grasses that make up the everglades. I believe that as long as these marshy areas exist as they are in Southern Florida, *Euphyes berryi* as well as all the other grass feeding skippers in this habitat will have a safe haven to thrive in year after year. Each spring, the thistle blooms call to the Hesperids of the Everglades and we can catch a glimpse of the vast Lepidopteran fauna that exists there. By standing and watching the "River of Grass", one would never think that there would be so many butterflies present but the springtime thistle blooms always proves otherwise! If you have any interest in butterfly photography or wildlife photography in general, the small stretch of dirt road that makes up route 839 will never leave you disappointed in the early spring!

\*\*\*\*\*

## SLS MEMBERS

Please check your address label to see if it has the year 2007. If not, you owe dues.

## ARTICLES FOR FUTURE NEWSLETTERS

Biographies of Titian Ramsay Peale, a noted American artist, naturalist, entomologist and photographer, and Ferdinand Heinrich Hermann Strecker, an American entomologist specializing in butterflies and moths, will appear in a future newsletter.

\*\*\*\*\*



## REPORTS OF STATE COORDINATORS

**Alabama:** C. Howard Grisham, 573 Ohatchee Road, Huntsville, AL 35811, E-Mail: [chgrisham@Comcast.net](mailto:chgrisham@Comcast.net)

**Arkansas:** Mack Shotts, 514 W. Main Street, Paragould, AR 72450, E-Mail: [cshotts@grnco.net](mailto:cshotts@grnco.net)

Listed below are some of the noteworthy species from a collecting trip on 30-Mar-07 at Nola, Scott County, AR, sent in by David Rupe:

Butterflies: *Amblyscirtes aesculapius*, *Amblyscirtes vialis*, *Erynnis juvenalis*, *Callophrys niphon*, *Callophrys gryneus*, and *Eurytides marcellus* (>50 observed).

Moths: *Thyris sepulchralis* (>100 gathering around mud puddles).

**Florida:** Charles V. Covell Jr., w07 NE 9<sup>th</sup> Ave, Gainesville, FL 32601, E-Mail: [covell@louisville.edu](mailto:covell@louisville.edu)

Charlie makes the following correction concerning his previous reportings of *Pyrgus communis*. He now states that what he referred to as *P. communis* should have been identified as *Pyrgus albescens* which has replaced *P. communis* in N. Florida in recent years.

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

John Hyatt sends the following two reports:

**Georgia: McIntosh Co., vicinity of Meridian: March 28, 2007:** *Hyalophora cecropia* - unusual sighting of an increasingly rare species; probably county record.

**Georgia: McIntosh Co., vicinity of Meridian, May 18-25:** Despite exceedingly dry conditions (fortunately the smoke from large fires to the SW of McIntosh Co. was blowing away from this area), *Catocala* responded well to beer-banana bait and hairstreaks were reasonably abundant on the odd flowering chinquapin tree. Taken were *Dahana atripennis*, *Litoprosopus futilis*, *Catocala ilia*, *micronympha*, *coccinata*, *insolabilis*, *andromedae*, *gracilis*, *ultronia*, *muliercula*, and *epione*. Lycaenids included *P. m-album*, *A. halesus*, *E. favonius*, *E. "ontario"*, *S. calamus calamus* and *S. c. falacer*, *S. melinus*, and *C. cecrops*. Oddly enough, *S. kingi* and *liparops liparops* remain undiscovered in this coastal county.

James Adams sends the following report: Abbreviations are as follows: James Adams (JA or no notation), Irving Finkelstein (IF). Other contributors names spelled out with the appropriate records. Most records presented here represent new or interesting records (range extensions, unusual dates, uncommon species, county records, etc.) or records for newly investigated areas. Known County and State records are indicated. All dates listed below are 2007 unless otherwise specified.

**Calhoun, Gordon Co.:**

**NOCTUIDAE:** *Pyreferra hesperidago*, April 4 (LATE). **GEOMETRIDAE:** *Xanthorhoe lacustrata*, April 4.

**COSSIDAE:** *Prionoxystus macmurtrei*, common during much of April, currently rearing larvae on carrots.

**Carbondale, Whitfield Co.:**

**NOCTUIDAE:** *Acronicta funeralis*, April 13 (COUNTY).

**Salacoa Road at Salacoa Creek, 5 mi. SE of Fairmount, NE corner of Bartow Co.**

**May 26-27:**

**NOCTUIDAE:** *Idia scobialis* (COUNTY), *Spiloloma lunilinea*, *Catocala ilia*, *Acronicta connecta*, *A. spinigera*, *Ozarba aerea*, *Argillophora furcilla*, *Apamea cariosa* (COUNTY), *Dipterygia rozmani*. **GEOMETRIDAE:**

(REPORTS OF STATE COORDINATORS are continued on page 67.)

## CATOCALA MIRANDA HY. EDWARDS 1881 IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

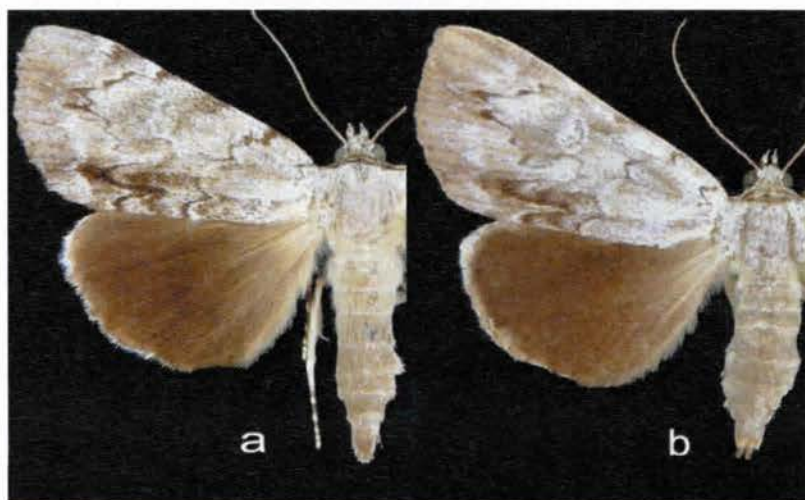


Fig. 1. *Catocala miranda*: a. male, b. female.



Fig. 2. Parish records by the author.

The rarely encountered small-sized black hindwing underwing moth *Catocala miranda* (Fig. 1) is known to occur in Louisiana from a series of five specimens, four males and one female, captured at sec.24T6SR12E, 4.2 mi. NE of Abita Springs, St. Tammany Parish, Louisiana (Fig. 2) in a 25-year period of operating four to six light traps nightly and year-round. The dates of capture of these five specimens are May 20 to June 7. Both sexes of *miranda* appear quite similar in maculation and the fringe on hindwings is gray except near the apex which is whiter. Barnes and McDunnough (1918) reported knowing *miranda* only from the type specimen in the American Museum (Natural History) from Washington D.C. Sargent (1976) stated *miranda* is very rare and local, occurring in Massachusetts and Pennsylvania to North and South Carolina. Covell (1984) reported *miranda* to occur only in coastal states Massachusetts to Florida and as local and uncommon to rare.

In the first edition of *A Field Guide to the Moths of Eastern North America* (Covell, 1984), and later reprintings of this edition, the specimen depicted as "*C. miranda*" on plate 34 actually is a specimen of *Catocala orba* Kuznezov. In the second edition (Covell, 2005) produced in conjunction with the Virginia Museum of Natural History, the text description is corrected on plate 34 which now states the specimen illustrated is *C. orba*. Further confusing this issue, the statement by Covell (1984) "... *C. miranda* Hy. Edw. ... is usually slightly larger" than *orba*, is unchanged in the 2005 edition, when in fact *miranda* is smaller than *orba*.

Heppner (2003) states *miranda* occurs: se US: Massachusetts to Florida, Arkansas and Texas. Knudson and Bordelon (1999) list *miranda* as a questionable record or determination for Texas. I thank the following person for commenting on this article: Charles V. Covell.

## Literature Cited

- Barnes, WM and J. McDunnough. 1918. Illustrations of the North American species of the genus *Catocala*. *Mem. Am. Mus. Nat. Hist. New Series*, Vol. III, part 1.
- Covell, Jr., C.V. 1984. *A Field Guide to the Moths of Eastern North America*. The Peterson Field Guide Series No. 30. Houghton Mifflin Co., Boston. xv + 496pp., 64 plates.
- Covell, Jr., C.V. 2005. *A Field Guide to the Moths of Eastern North America*. Virginia Mus. Nat. Hist. spec. pub. No. 12. xv + 496pp., 64 plates.
- Edwards, Hy. 1881, *Papilio*, I, p.118
- Heppner, J.B. 2003. *Arthropods of Florida and Neighboring Land Areas*, vol. 17: Lepidoptera of Florida, Div. Plant Industry, Fla. Dept. Agr. & Consum. Serv., Gainesville. x + 670 pp., 55 plates.
- Knudson, E. and C. Bordelon. 1999. *Texas Lepidoptera Survey, Checklist of the Lepidoptera of Texas*, 2000 edit.
- Sargent, T.D. 1976. *Legion of Night: The Underwing Moths*. Amherst, Univ. Mass. Press, 222 pp., 8 plates.

(REPORTS OF STATE COORDINATORS are continued from page 65.)

*Euchlaena johnsonaria* (2, COUNTY, apparently very local in GA), *Idaea celtima*, *Xanthorhoe lacustrata* (COUNTY).

June 9-10:

**NOTODONTIDAE:** *Dasylophia anguina*. **NOCTUIDAE:** *Idia denticulalis* (uncommon in N. GA), *I. minualis* (second from N. GA, same location; large specimen for this species), *I. lubricalis*, *Dyspyralis puncticosta* (COUNTY), *Hemeroplanis scopulepes* (common, and two forms), *Colobochyla interpuncta*, *Ozarba aerea*. **GEOMETRIDAE:** *Trigrammia quadrinotaria* (unusually common), *Tornos scolopacinarius*, *Metarranthis angularia*, *M. sp. nr. angularia* (very late), *Nepytia sp. nov.* (COUNTY), *Idaea ossularia*, *I. violacearia*. **PYRALIDAE:** *Omphalocera munroei*.

Pine Log WMA, Bartow Co., June 10/12, 2007, Pierre Howard/Bob Zaremba:

**NYMPHALIDAE:** *Speyeria diana* (9 males). **LYCAENIDAE:** *Harkenclenus titus* (4). (The Diana fritillaries and Coral Hairstreaks were on Queen Anne's Lace). **HESPERIIDAE:** *Poanes hobomok*.

Taylor's Ridge, north side of Hwy. 136, Co. Rd. 250, 5 miles WNW of Villanow, Walker Co., JA & IF:

March 23:

**PAPILIONIDAE:** *Papilio polyxenes*, (Uncommon and EARLY). **LYCAENIDAE:** *Glaucopsyche lygdamus* (first time seen at this location in about five years – nice to know it is not gone from this location). **SATURNIIDAE:** *Hyalophora cecropia* cocoon (viable, since hatched).

May 12-13:

**SPHINGIDAE:** *Paonias astylus*. **ARCTIIDAE:** *Grammia anna* (abundant, including some nice variants), *G. figurata*. **NOCTUIDAE:** *Idia scobialis* (common!), *Drasteria grandirena*, *Zale undularis*, *Polychrysia morigera* (4<sup>th</sup> from GA, 3<sup>rd</sup> from here), *Agriopodes fallax*, *Baileya acadiana* (COUNTY). **GEOMETRIDAE:** *Ectropis "crepuscularia"* (several specimens, all extremely small), *Lytrosis permagnaria* (several), *Gueneria similaria*, *Metarranthis indeclinata*, *Idaea eremiata* (COUNTY). **LIMACODIDAE:** *Monoleuca semifascia*. **TORTRICIDAE:** *Choristoneura fumiferana*.

Crockford/Pigeon Mountain WMA, west side of Pigeon Mountain, 9 mi WSW of LaFayette, March 31, JA & IF:

**PAPILIONIDAE:** *Papilio (Heraclides) cressphontes* (EARLY).

Gates Chapel Road, 8 mi. NW of Ellijay, Gilmer Co., all IF:

March 25 - 27:

**PIERIDAE:** *Anthocharis midea*. **SATURNIIDAE:** *Actias luna*. **LASIOCAMPIDAE:** *Phyllodesma americana*. **NOTODONTIDAE:** *Closteria inclusa*. **NOCTUIDAE:** *Hypsoropha monilis*, *Zale lunifera*, *Z. aeruginosa*, *Z. calycanthata*, *Z. lunata*, *Z. minerea*, *Z. bethunei*, *Z. metatoides*, *Baileya dormitans*, *B. ophthalmica*, *Colocasia propinquinelinea*, *Panthea "furcilla"*, *Iodopepla u-album*, *Cerastis tenebrifera*, *Hyppa contrasta* (EARLY), *Orthosia hibisci*, *O. revicta*, *O. rubescens*, *Psaphida resumens*, *P. rolandi*, *P. grandis*, *P. electilis*. **DREPANIDAE:** *Drepana arcuata* (EARLY). **GEOMETRIDAE:** *Macaria granitata*, *M. minorata*, *M. fissinotata*, *Ceratomyx satanaria*, *Lomographa glomeraria* (very common, but all females), *Selenia kentaria* (very common), *Plagodis alcoolaria*, *Metarranthis*, sp. nov. (nr. *angularia*), *Lambdina pellucidaria*, *L. fervidaria*, *Nemoria bistriaria*, *Euphyia unangulata*, *Cladara atroliturlata*, *C. limitaria*. **PYRALIDAE:** *Diacme phyllisalis*. **TORTRICIDAE:** *Argyrotaenia mariana*. **TINEIDAE:** *Fernaldia anatomella*.

May 13 - 14:

**SPHINGIDAE:** *Deidamia inscripta* (late). **NOCTUIDAE:** *Abablemma brimleyana*, *Raphia abrupta*, *Leuconycta diphteroides* (common, 8 - 10 seen). **GEOMETRIDAE:** *Macaria pinistrobata* (common), *Eufidonia convergaria* (common, but males only), *Lytrosis permagnaria*, *Anagoga occiduaria*, *Plagodis fervidaria*, *P. alcoolaria*. **LIMACODIDAE:** *Packardia geminata* (common).

May 27 - 28:

**NOCTUIDAE:** *Oruza albocostaliata*, *Argillophora furcilla*. **SESSIIDAE:** *Synanthedon fatifera* (COUNTY). **TINEIDAE:** *Fernaldia anatomella* (several).

June 1-3:

**SPHINGIDAE:** *Lapara nr. bombycoides* (EARLY, and common). **NOCTUIDAE:** *Idia rotundalis* (ridiculously abundant!), *Hypena sordidula* (COUNTY), *H. madefactalis*, *Catocala ilia*, *Tarachidia semiflava*, *Phlogophora iris* (COUNTY, second location in STATE). **GEOMETRIDAE:** *Eufidonia convergaria* (LATE, and still fresh),



*Euchlaena irraria* (abundant), *E. muzaria* (very yellow, similar in appearance to *E. serrata*). **TINEIDAE**: *Fernaldia anatomella* (note that this species has been collected nearly every visit this year).

Jasper, Pickens Co., June 2, IF:

**NOTODONTIDAE**: *Peridea ferruginea*. **NOCTUIDAE**: *Harrismemna trisignata*.

Near Dillard, Rabun Co., May 26, 2007, Bob Zaremba:

**HESPERIIDAE**: *Polites peckius*. **NYMPHALIDAE**: *Boloria bellona*.

Black Rock Mountain State Park, Rabun Co., April 28, Michael Chapman & Francis Michael:

**LYCAENIDAE**: *Glaucopsyche lygdamus* (2). The Silvery Blue, which had apparently not been encountered for a few years in N GA thankfully still seems to be in GA, not only here but at Taylor's Ridge (see above).

Thomaston, near Thomaston Airport, Upson Co., July 12, 2001, Michael Beohm:

**NOCTUIDAE**: *Catocala serena* (COUNTY; same year as the species outbreak in NE GA).

Ohoopsee Dunes, Tract 4 (Covena Tract), 9 miles SW of Swainsboro, Emanuel Co., April 20-21:

**SPHINGIDAE**: *Paonias myops*. **NOTODONTIDAE**: *Nadata gibbosa*, *Lochmaeus manteo*. **ARCTIIDAE**: *Clemensia albata*, *Holomelina opella*, *Spilosoma virginica*, *Grammia placentia*, *Halysidota tessellaris*. **NOCTUIDAE**: *Renia flavipunctella*, *R. adspersgillus*, *Hypsoropha monilis*, *Pangrapta decoralis*, *Argyrostromis flavistriaria*, *A. sylvorum*, *Phoberia atomaris*, *Nola pustulata*, *Acrionicta brumosa*, *Elaphria festivoidea*, *Iodopepla u-album*, *Leucania extincta*, *Lepipolys perscripta* (STATE?), *Anorthodes tarda*. **GEOMETRIDAE**: *Eumacaria*, *latiferrugata*, *Anavitrinella pampinaria*, *Iridopsis defectaria*, *Hypomecis umbrosaria*, *Lytrosis sinuosa*, *Euchlaena madusaria*, *Eupithecia miserulata*. **COSSIDAE**: *Prionoxystus robiniae*. **OECOPHORIDAE**: *Antaeotricha schlagerei*.

Ohoopsee Tract 2, 8 mi. W of Swainsboro along hwy. 80, April 20:

**GEOMETRIDAE**: *Fernaldella georgiana*.

Hwy. 1, ½ mile S of I-16 at exit 90 (type locality), April 21:

**GEOMETRIDAE**: *Fernaldella georgiana*.

Horse Creek WMA, 12 mi. SSW of Lumber City, along Ocmulgee River, Telfair Co., April 21-22:

**SATURNIIDAE**: *Actias luna*, *Antheraea polyphemus*. **LASIOCAMPIDAE**: *Malacosoma americana*. **SPHINGIDAE**: *Paonias excaecatus*. **NOTODONTIDAE**: *Nadata gibbosa*, *Peridea angulosa*, *Heterocampa umbrata*, *Lochmaeus bilineata*, *Schizura* sp. nov. **ARCTIIDAE**: *Clemensia albata*, *Cisthene plumbea*, *C. subjecta*, *Euerythra phasma*, *Apantesis nais*, *Halysidota tessellaris*. **NOCTUIDAE**: One completely unidentified small brown species (3 specimens), *Idia diminuendis*, *Zanclognatha cruralis*, *Z. jacchusalis*, *Chytolita morbidalis*, *Renia flavipunctalis*, *Renia salusalis*, *Renis* sp., *Bleptina caradrinalis*, *Hypena bijugalis*, *H. palparia*, *H. scabra*, *Redectis pygmaea*, *Phyprosopus callitrichoides*, *Arugisa latiorella*, *Pangrapta decoralis*, *Argyrostromis anilis*, *Lesmone detrahens*, *Caenurgina chloropha*, *Panopoda rufimargo*, *P. carneicosta*, *Catocala clintoni*, *Acrionicta lobeliae*, *A. vinnula*, *Lithacodia muscosa*, *Thioptera nigrofimbria*, *Hyperstrotia villificans*, *Baileya ophthalmica*, *Balsa malana*, *B. tristigella*, *Iodopepla u-album*, *Amolita fessa*, *Elaphria festivoidea*, *Leucania scripicola*, *L. adjuta*, *Leucania callidior*, *Anorthodes tarda*, *Agrotis ipsilon*, *Anicla infecta*, *Euagrotis lubricans*. **GEOMETRIDAE**: *Macaria bicolorata*, *M. distribuaria*, *Nematocampa baggetaria*, *Protoarmia porcellaria*, *Ectropis crepuscularia*, *Aethalura intertexta*, *Anavitrinella pampinaria*, *Iridopsis defectaria*, *I. vellivolata*, *Hypomecis umbrosaria*, *Melanolophia signataria*, *Exelis pyrolaria*, *Hypagyrtis unipunctata*, *H. esther*, *Lomographa vestaliata*, *Erastria cruentaria*, *Euchlaena amoenaria*, *E. obtusaria*, *Eubaphe mendica*, *Probole amicaria*, *Eutrapela clemataria*, *Tetracis crocallata*, *Nemoria rubrofrontaria*, *Synchlora aerata*, *Scopula limboundata*, *Idaea furciferata*, *Lophosis labeculata*, *Costaconvexa centrostrigaria*, *Eupithecia miserulata*, *Horsime intestinata*. **LIMACODIDAE**: *Lithacodes fasciola*. **PYRALIDAE**: *Colobochylus talis*, *Apogeshna stenialis*, *Desmia funeralis*, *Nomophila nearctica*, *Palpita magniferalis*. **OECOPHORIDAE**: *Antaeotricha schlagerei*.

Harris Neck NWR, McIntosh County, May 31, 2007, Bob Zaremba:

**HESPERIDAE**: *Urbanus dorantes*.

DNR's recently purchased Sand Hills Natural Area near Butler, Taylor Co., June 10, 2007, Jerry and Rose Payne:  
**HESPERIIDAE:** *Problema byssus* (COUNTY).

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

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

**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

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

**Tennessee:** John Hyatt, 5336 Foxfire Place, Kingsport, TN 37664, E-Mail: jkshyatt@aol.com

John sends the following reports for the TN and TN/VA border areas: Spring came very early to the southern Appalachians, with leps flying on March 15 and many spring species abundant by April 1-2, when trees were fully leafed out. However, a hard freeze with night temps in the upper teens-low 20's through the period April 5-9 killed all the tree foliage and apparently wiped out most butterflies. Two cold (but not freezing), wet weeks followed; by April 21-22 temps were back in the high 70's but trees still bare of green. An April 22 trip to a dirt road in Scott Co., VA (very near the VA/TN border) revealed only *Pieris virginiensis* and 2 *Erynnis* species in noticeable numbers; 4 specimens of *Papilio* (2 *philenor*, 1 each of *glaucus* and *troilus*) were seen in a 2-hour walk on a road that usually has hundreds of *papilios* at this time of year. Not a single Lycaenid or Nymphalid was seen, nor were any *Colias* or orange-tips seen. It will be interesting to see what recovery the later broods of the multiply-brooded species make.

In May - early June, butterflies in general, and Papilionids and Lycaenids especially, remained very sparse in the southern Appalachians of eastern TN. *P. "appalachiensis"* was seen only twice on the TN/NC border in Unicoi Co., TN, on May 31, and *C. neglectamajor* was not observed at all in its usual haunts around the end of May. No *Incisalius* were observed at all this spring. Conditions very dry (ca. 45% of average annual rainfall to date), and there was a very late - season hard freeze in April.

**Texas:** Ed Knudson, 8517 Burkhardt Road, Houston, TX 77055, E-Mail: [eknudson@earthlink.net](mailto:eknudson@earthlink.net)

Ed sends in the following report for east Texas for the dates April 16 - April 22: from Beaumont to Atlanta -- counties sampled (See legend).

#### LEGEND:

A = All

J = Jasper Co. Martin Dies SP

Je = Jefferson Co.

H = Harrison Co. Caddo Lake SP

Ha = Hardin Co.

T = Tyler Co.

P = Panola Co.

M = Marion Co.

C = Cass Co. Atlanta SP & vicinity

B = Bowie Co. Sulphur River

S = Sabine Co. Six Mile

\* = NCR (New County Record)

Also sightings of many of the same in Shelby, Newton, Nacogdoches, and Angelina Co.'s, but no NCR's or significant difference. File these under "A." unless otherwise noted. *E. marcellus* remains undocumented for Jefferson (Charles Bordelon).

#### Hesperiidae:

*Epargyreus clarus* J, S, B, C

*Achalarus lyciades* S, Shelby\*, H\*, C

*Thorybes pylades* A

*Thorybes bathyllus* C

*Thorybes confusus* C\*, P\*, Shelby\* T, S

*Erynnis funeralis* J

*Erynnis horatius* B, T, C, J

*Pyrgus communis* A

*Pyrgus oileus* J

*Nastra lherminier* J

*Lerema accias* A  
*Hylephila phyleus* A  
*Euphyes vestris metacomet* A

**Papilionidae:**

*Battus philenor* A  
*Eurytides marcellus* H, Ha, T, J, S, M, C  
*Papilio polyxenes asterius* J, C, B  
*Papilio cresphontes* A  
*Papilio glaucus* A  
*Papilio troilus* A  
*Papilio palamedes* Ha, T, J, (A, N, Shelby)

**Pieridae:**

*Colias philodice* M\*, C\*  
*Colias eurytheme* A  
*Zerene cesonia* M, C  
*Phoebis sennae eubule* A  
*Phoebis agarithe* S  
*Pieris rapae* C  
*Pontia protodice* C

**Lycaenidae:**

*Satyrrium calanus falacer* B\*  
*Satyrrium favonius ontario* S\*  
*Callophrys gryneus* P  
*Callophrys niphon* S, H  
*Calycopis isobea* S\*  
*Calycopis cecrops* S, H, C, B  
*Strymon melinus* A  
*Cupido comyntas* C, B

**Libytheidae/Danaidae/ Nymphalidae/Satyridae:**

*Libytheana carinenta bachmanii* A  
*Danaus plexippus* A  
*Limenitis arthemis astyanax* J, C, B, S, H, T  
*Limenitis archippus* B  
*Agraulis vanillae incarnata* A  
*Euptoieta claudia* C, B, J  
*Asterocampa celtis* A

*Asterocampa clyton* H  
*Vanessa virginiensis* A  
*Vanessa cardui* C, B, T, H  
*Vanessa atalanta rubria* C, B, J  
*Polygonia interrogationis* A  
*Junonia coenia* A  
*Chlosyne nycteis* C, B  
*Phyciodes tharos* A  
*(P. cocythus?)* C  
*Anaea andria* C, B  
*Lethe portlandia missarkae* J, S, C, B, M, Shelby\*  
*Cyllopsis gemma* J, C  
*Hermeuptychia sosybius* A  
*Megisto cymela viola* A, ©\*)

**Sphingidae:**

*Dolba hyloeus* C\*, H\*, J\*, S  
*Hemaris diffinis* H\*  
*Sphecodina abbotti* S  
*Amphion floridensis* J, H, C\*, P  
*Darapsa myron* C\*, S

**Saturniidae:**

*Antheraea polyphemus* J, S\*, H, C\*  
*Actias luna* A  
*Automeris io* S\*, C\*

**Sesiidae:**

*Synanthedon rubrofascia* J  
*Synanthedon acerni* J, C\*  
*Synanthedon pictipes* J  
*Podosesia syringae* J, S, H, M\*, C\*  
*Paranthrene tabanaformis* J\*  
*Paranthrene simulans* J

**Noctuidae:**

*Parahypenodes quadralis* H\* STATE RECORD  
*Pseudorthodes vecors* C\*

One other interesting record for Spring Valley, Harris Co., on 23-III-07, *Scoliopteryx libatrix*, one female in a bait trap (Knudson). This is the first Texas specimen I have seen, although it has been reported from central TX, and probably north TX.

**Virginia:** Harry Pavulaan, 494 Fillmore Street, Herndon, VA 22070, E-Mail: [pavulaan@aol.com](mailto:pavulaan@aol.com)

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*



SPOTLIGHT ON REARING *AUTOMERIS IO LILITH* (STRECKER)

BY

VERNON ANTOINE BROU JR.

The common Louisiana saturniid species *Automeris io lilith* (Strecker) is easy to rear in desktop containers or in sleeves upon common food plants as cherry and common privet. Newly hatched larvae do not like privet, but later instars accept it readily. Mid-instar and mature larvae of *lilith* can exhibit yellow and green color forms in Louisiana and this attribute reportedly occurs from the Carolinas to Louisiana, the reported range of *lilith*. The bright yellow larvae with a bright red longitudinal stripe is quite striking and red markings are noticeably brighter red than on the green color forms which display a maroon-colored stripe. Some larvae batches have approximate equal numbers of both color forms. *A. io lilith* usually has at least four annual broods peaking at approximately 46-day intervals in Louisiana (Brou, 2003) and adults are attracted to ultraviolet light.

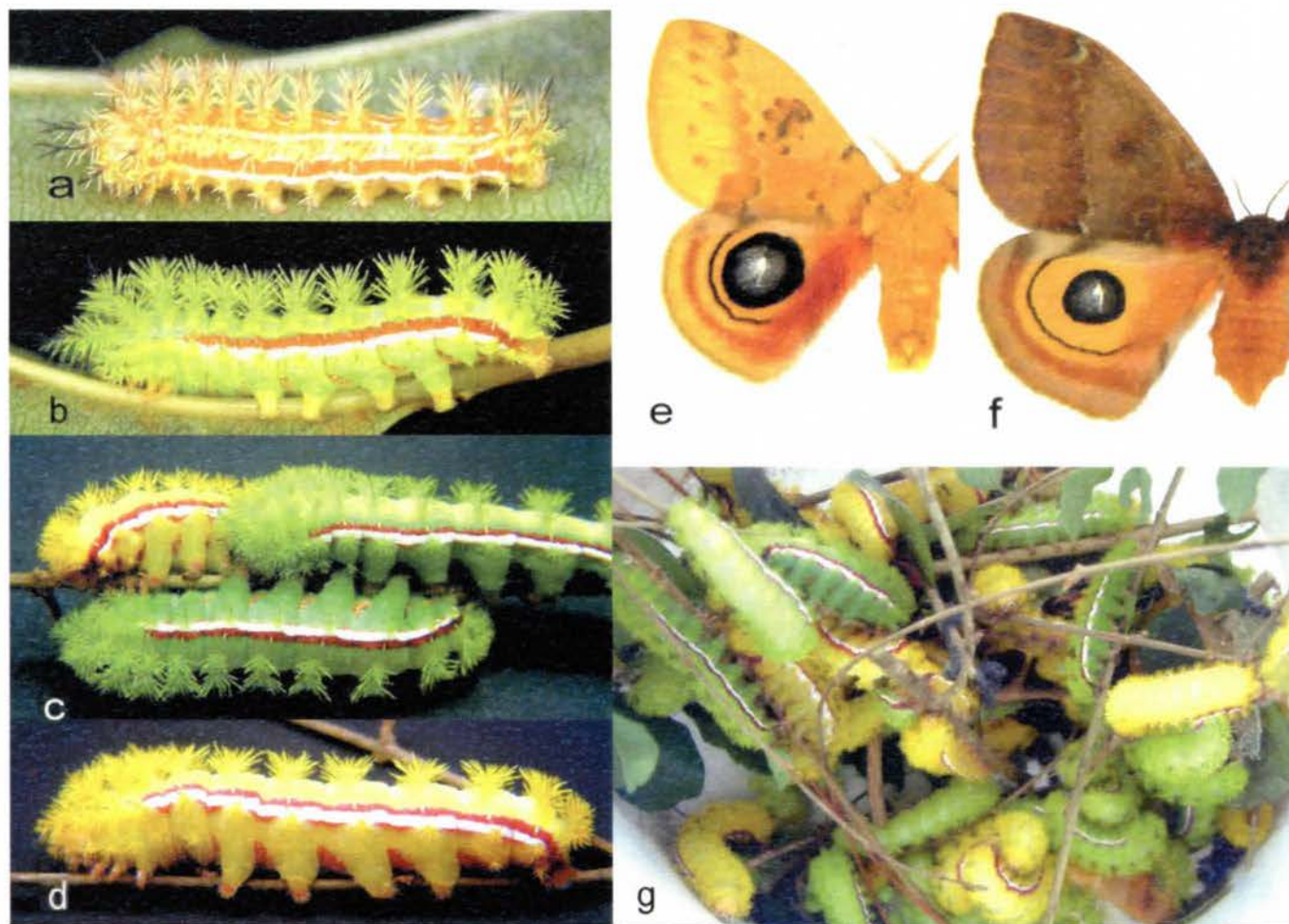


Fig. 1. *Automeris io lilith*: a. early instar larva, b. mid instar larva, c. mature larvae, d. mature yellow larva, e. adult male, f. adult female, g. mature larvae.

## Literature Cited

Brou, Vernon A. 2003. *Automeris io lilith* (Strecker) in Louisiana. *South. Lepid. News* 25: 44-45.

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

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

**PORTENTOMORPHA XANTHIALIS (GN.) IN LOUISIANA**

BY

VERNON ANTOINE BROU JR



Fig. 1. *Portentomorpha xanthialis* (Gn.)

A single female specimen of the tropical pyralid moth *Portentomorpha xanthialis* (Gn.) was captured at sec.24T6SR12E, 4.2 mi. NE of Abita Springs, Louisiana on Oct. 29, 1997, in an ultraviolet light trap. The type locality of *xanthialis* is Cuba. *P. xanthialis* was reported by Kimball (1965) from Florida. Munroe (1976) pictured adults, a male from Bolivia and a female from Brazil, plate U, figs. 3 & 4, and stated *xanthialis* is widespread in the American tropics from the West Indies and Mexico to Bolivia. Munroe listed records in the United States from Florida and Texas. Heppner (2003) reported the range of *xanthialis* to be Florida, Texas, West Indies, Mexico to Bolivia. This is a new record for Louisiana.

**Literature Cited**

- Guenée, A. 1854. *Species Generaldes Lepidopteres. Tome huitieme. Deltoïdes et Pyralites*. 448 pages, 10 plates. Paris.
- Heppner, J.B. 2003. *Arthropods of Florida and Neighboring Land Areas*, vol. 17: Lepidoptera of Florida, Div. Plant Industry, Fla. Dept. Agr. & Consum. Serv., Gainesville. x + 670 pp., 55 plates.
- Kimball, C. P. 1965. *Arthropods of Florida and neighboring land areas*, vol. 1: Lepidoptera of Florida, Div. Plant Industry, Fla. Dept. Agr., Gainesville. v + 363pp., 26 plates.
- Munroe, E., in Dominick, R. B., et al., 1976. *The Moths of America North of Mexico*, Fasc. 13.2B, Pyraloidea (in part).

(Vernon Antoine Brou Jr., 74320 Jack Loyd Road, Abita Springs, Louisiana 70420; E-Mail: [yabrou@bellsouth.net](mailto:yabrou@bellsouth.net))

\*\*\*\*\*

\*\*\*\*\*

The Southern Lepidopterists' News is published four times annually. Membership dues are \$20.00 annually. The organization is open to anyone, especially those with an interest in the Lepidoptera of the southern United States. Information about the Society may be obtained from Paul Milner, Membership Coordinator, 272 Skye Drive, Pisgah Forest, NC 28768, and dues may be sent to Jeffrey R. Slotten, Treasurer, 5421 NW 69<sup>th</sup> Lane, Gainesville, FL 32653.

\*\*\*\*\*

**SOUTHERN LEPIDOPTERISTS' SOCIETY**

c/o J. BARRY LOMBARDINI, THE EDITOR

3507 41<sup>st</sup> Street

Lubbock, Texas 79413