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J. BARRY LOMBARDINI: EDITOR

BUTTERFLIES FROM MISSION, TEXAS

BY

MIKE RICKARD

Guatemalan Cracker (*Hamadryas guatemalena*), August 2, 2016, National Butterfly Center, Mission Texas

Gray Cracker (*Hamadryas februa*), August 11, 2016, National Butterfly Center, Mission, Texas

Many-banded Daggerwing (*Marpesia chiron*), August 11, 2016, National Butterfly Center, Mission, Texas

Dingy Purplewing (*Eunica monima*), August 13, 2016, sighted in Mike's yard, Mission, Texas (actually sitting on his car)

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

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MANY THANKS TO THE FOLLOWING DONOR WHO CONTRIBUTED TO THE SL SOCIETY (June - September, 2016)

Contributor

David Wagner

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WELCOME TO OUR NEWEST MEMBER TO THE SOUTHERN LEPIDOPTERISTS' SOCIETY

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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/

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PALPITA QUADRISTIGMALIS (GUENÉE, 1854) (LEPIDOPTERA: CRAMBIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

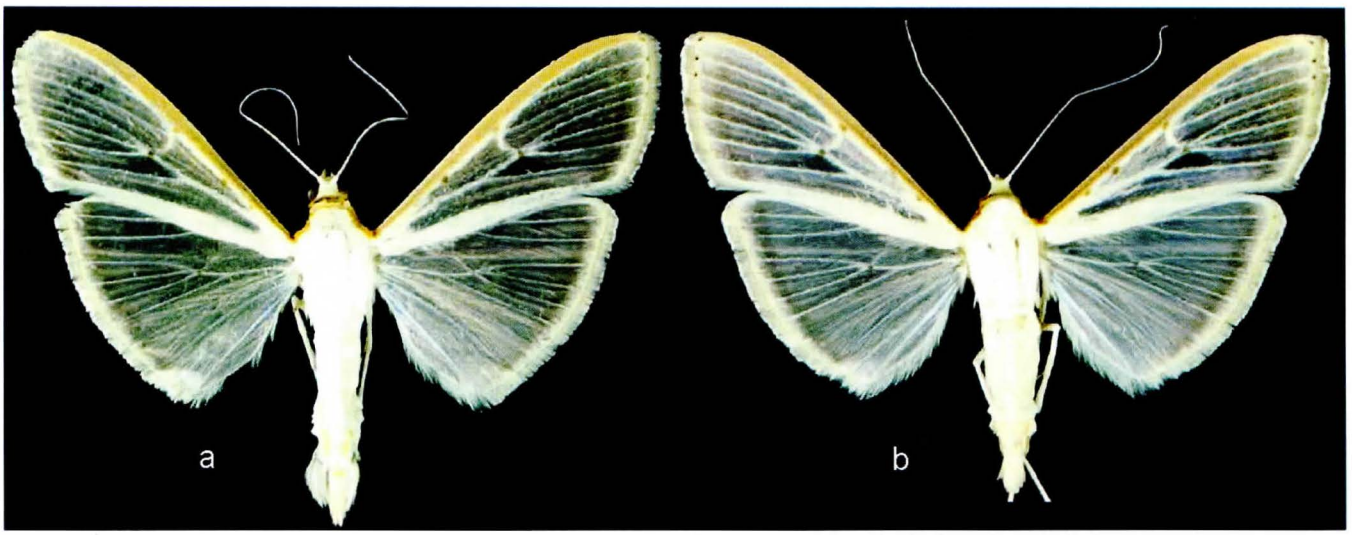

Fig. 1. ***Palpita quadristigmalis*** phenotypes: a. male, b. female.

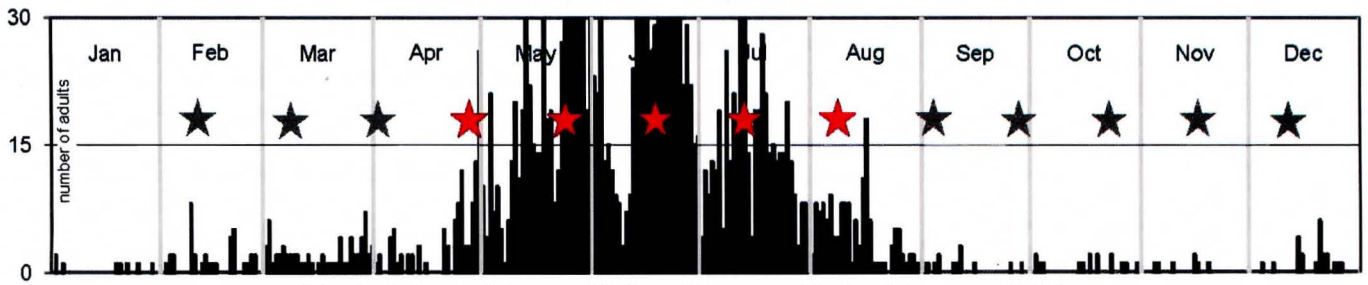

Fig. 2. Adult ***Palpita quadristigmalis*** captured in Louisiana. n = 2,493

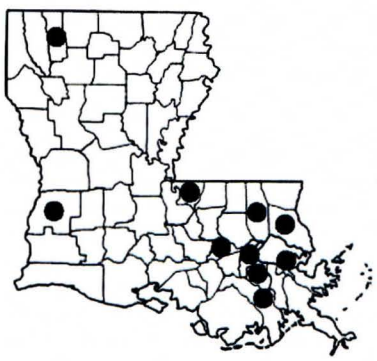

Fig. 3. Parish records for ***P. quadristigmalis.***

Within Louisiana, the very abundant and well known pyralid moth with translucent wings, ***Palpita quadristigmalis*** (Guenée) (Fig. 1), appears to have as many as thirteen annual broods at about 25-day intervals; though only about five broods are significantly populated (red stars), based on the numbers of adults (2,493) defined by this study and at this latitude (Fig. 2). This species was not covered by Covell (1984). Heppner (2003) listed the range of ***quadristigmalis*** to include the Gulf Coast: Florida to Texas and West Indies. Powell and Opler (2009) stated the range to include West Indies and Central America, Gulf and Atlantic States, Colorado, New Mexico, and southern Arizona. Dubbed as *'The Privet Moth'* and reported as a pest upon ***(Privet) Ligustrum*** species (Holland, 1903), who reported four broods in Washington DC. Hayden and Buss (2012) addressed differences between a new invasive species to Florida, ***Palpita persimilis*** Munroe with two other species ***quadristigmalis*** and ***Palpita kimballi*** Munroe. Wings of ***quadristigmalis*** males are more transparent than on females. The parish records are illustrated in Fig. 3. I thank James Hayden for commenting on this manuscript.

Literature Cited

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.

Hayden, J.E. & L. Buss, 2012. *Olive shootworm (Palpita persimilis) in Florida.* Florida Dept. Agric. and Consumer Serv., Div. of Plant Industry, Entomology Circular Number 426, 6 pp.

Holland, W.J., 1903. *The Moth Book.* New York, Doubleday, Page & Co. reprinted 1968 New York: Dover, 479 pp., 48 plates.

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.

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

NOTES ON FIELD TECHNIQUES FOR MICRO - MOTHS

BY

J. B. HEPPNER

Collecting and preparing microlepidoptera (or micro-moths) has been thought daunting to many moth collectors, but actually is about the same as for other moths, just needing a bit more care in handling. The commonest moth collecting technique, however, with lights on a white sheet is inadequate and not efficient for micro-moths (actually even for larger moths, other than perhaps giant moths). One tends to cherry-pick specimens on a sheet, thus missing many specimens. What one should use is a light trap (sheet collecting is not a "light trap"): a trap is for collecting all specimens in a container with a light on top to attract moths, thus actually trapping the moths in the container. With a trap one will get many more of the smallest moths which otherwise will often be missed on a sheet, especially if there are 100s or 1000s of other moths and insects on the sheet impeding visibility. However, some moths tend to perch on the vanes or near a trap, so sheet collecting also offers some advantages. With sheet collecting, one typically uses a large central light, such as mercury vapor (MV) or metal halide which also have white light besides the UV spectrum, and one or more side UV light tubes (Fig. 1b-c): using UV tubes usually is better for many micro-moths which tend to congregate more at the UV lights than under the brighter "white" lights. Some arrangements also use a large MV light (500-watt) set very high on a pole, up to 10m (30 feet) above the sheet, and more lights below on the sheet (250-watt MV and UV tubes): this arrangement is good for areas where the light thereby then shines above the tree canopy to a larger area to attract more moths. Most sheet collecting is done with a vertical sheet, but some use a sheet on the ground and the light above this: the disadvantage of this method is the difficulty of getting around to collect moths on such a ground sheet.

For light traps, various dealers sell such traps of various design, or one can make a simple trap with cross-mounted upright vanes of aluminum, plexiglas, or even cardboard, and a light in the center or above, all mounted over a large funnel (round or square) with a wide opening below, set atop a bucket of some kind. The bucket container should be large enough for the expected catch: usually a small 2-gallon bucket would be enough, but during large flights of moths, one can use a larger garbage can-type container. In the bucket one should have at least two levels of grids with holes, becoming smaller as the grid levels go toward the bottom, thus the smallest moths will tend to go to the bottom of the trap and the largest moths and large beetles will stay above. We use rectangular plastic storage containers instead of round buckets, with the grids being plastic storage tops that precisely fit at different levels, each with holes of different sizes on each level: thus, 1/2-inch holes on the top level and 1/4-inch holes on the level below that. The container is then hung from the funnel inside a large plastic bag so the funnel bottom is several inches above the topmost trap grid (Fig. 1a). The so-called Robinson trap, first designed in England, simply has a MV bulb just above the funnel and without any vanes, then the bucket is set directly on the ground.

One adds paper towels on the sides at the bottom to allow small moths to find a nitch to hide while still alive to help prevent damage. A strong poison then needs to take effect (cyanide, ethyl acetate, or ammonium carbonate can work well). The poison is added to each level in small paper sacs: ammonium carbonate is perhaps the easiest for most persons to handle and the least dangerous to use. If electricity is readily available, one can also use a small freezer with a hole cut in the top, thus avoiding any poisonous chemicals. With a strong poison or a freezer, one usually finds most moths in perfect condition the next morning, the only exceptions being perhaps if a huge flight of beetles, ants, or termites has occurred during the night. Moth damage usually occurs only when the poison is not strong enough to dispatch the insects quickly and keep them from moving around so much. One imperative to these traps collected "dry", however, is to not have any rain get into the trap. Thus, a rain cover of some kind is needed: we usually use a sheet of plastic sheeting high over the trap (Fig. 1a), or the trap is placed under a building awning, but getting a 360° visibility area for a trap is best. The "wet" trap methods for other insects, those where one collects specimens in alcohol, do not have this problem, but for moths one needs a dry trap.

When moths are abundant, one trap may be all a collector can handle per day. When few moths are around, perhaps 4-6 traps can be used to increase the catch numbers per night, each trap distant enough to not be visible from the next trap, but this is a lot more work and a lot of equipment. Most moth collectors using light sheets tend to collect from dark to midnight, perhaps 4 hours, thus missing late night fliers (many Saturniidae) and any pre-dawn fliers, and also typically missing dusk fliers (e.g., many Tortricidae). A light trap should be set to start already at dusk and left to run until dawn. One collects the trap and its catch at dawn or early morning. Some lights are available with automatic light sensors to stop at dawn, to save battery power. Rather than sitting in front of a sheet for hours at a time, using a trap allows one to sleep at night, as well as getting almost all moths

Fig. 1. Traps and light sheet arrangements: a) UV light trap under rain canopy, with square funnel and designed to be disassembled for easy transport; plastic bag and collecting bucket would go beneath and the bag is attached to the rim of the funnel with plastic report binders (in Peru); b) self-standing light sheet arrangement, with MV and UV lights (in Korea); c) large light sheet arrangement with ropes tied to nearby trees or other supports, with 250-watt metal halide central light and 15-watt UV lights (in Guatemala); d) Townes-type 2m-flight trap (in Guatemala); e) large 6m-flight trap with cups at both ends, supported by 2.5m (8 foot) high poles at each end and tied to nearby trees (in Peru).

that come to the light. Traps are run either from car batteries, or other similar 12-volt batteries, or using direct current when available. Lights used typically are 18-inch 15-watt UV light tubes in the middle of the trap vanes, but MV lamps can also be used and set above the trap, and some lights available use very small UV tubes.

When used in the field, light traps also take in all other insects coming to the light. Typically, one collects the trap the next morning and then closes the container top for a few hours to make sure the insects have all died (beetles tend to "wake up" if the poison is not strong enough). One then sorts the trap sample, removing all the moths desired. In normal use, we take the trap "residue" of non-lepidopterans and put these samples into alcohol for other specialists to study: one can always donate such sample residues to cooperating museums and even take tax credits on such donations. Likewise, if the collector did not want all families of moths gotten with a trap, these also could of course be donated, either pinned or layered between paper towels (use a mold inhibitor chemical, like thymol or chlorocresol, and dry the layers). Residues should certainly not be discarded and wasted from scientific study, especially not when the insects have already been killed. To study moths and other insects, we simply need specimens to study, so some have to be sacrificed; however, one does not see the millions of such insects that are around, even 1000s of each species, so the few that get into the trap really have no impact on the populations of these insects in each area collected.

A further trap to use is a Malaise flight trap (named after René Malaise, a Swedish researcher who invented the trap for Hymenoptera collecting), operated primarily for day-flying insects. Rather than light to attract, these traps are simply netting designed to stop insects in flight, whereafter most tend to go upwards or towards the sun in efforts to escape the barrier, thus eventually getting trapped at one or both ends of the upwardly curved netting and into collection cups. Dealers sell commercially made traps, but one can also construct such traps if sewing is an option (6m traps cost about $350 or more, but the smaller Townes traps are much more economical). The large flight traps have collecting cups at each end (Fig. 1e), while the smaller flight traps like the original design of Malaise and those revised further, such as the Townes trap (Fig. 1d) designed by Henry Townes for Hymenoptera, are lighter and easily placed in small areas. The larger flight traps usually are more efficient and gather 4x the numbers of specimens that the small traps do, but the smaller traps have the advantage of being able to be set up in smaller areas. One can also use many flight traps to obtain larger catches. As for light traps, for moths we use such traps as a "dry" trap, with a poison bag in the collecting cups, while researchers after other insects typically run these traps with alcohol in the collecting cups. Such traps are found to be very useful in obtaining small day-flying species (e.g., Choreutidae, Glyphipterigidae, and early dusk-flying Tortricidae). When run the entire 24-hour period, these flight traps also have been found to collect many nocturnal Tineidae and some other small micro-moths which often do not come to lights. However, these traps require more effort to set up and run, and work best when positioned correctly, mostly perpendicular to updrafts, or across trails in forests or in openings between brush thickets, where more insects would tend to fly. Flight traps can also be baited with flowers or fruit, below the netting, to attract more insects.

After capture, micro-moths need more preparation than other moths. In my expeditions, larger moths are pinned into field boxes each day, giant moths and butterflies placed in envelopes. Micro-moths, on the other hand are sorted from the main catch and then each day pinned into small plastic boxes having dense foam bottoms (Fig. 2a). Using the same small micro-pins (called minuten pins) used for pinning the micro-moths, one then spreads the wings in the pinning box as shown by pushing the wings into position, usually with 8 minuten pins needed to complete the job to hold the wings in place. Typically, one tries not to push pins through the wings as shown in Fig. 2b, but many groups need this to keep the wings in place and the holes are very small. When possible, try to just push the wings into position with the minuten pin points and place the setting pin on the lower margin of each wing, rather than pushing a pin through the wing: the smallest micro-moths make this easier and only some larger species need a pin through the wings in some cases (e.g., many Tortricidae and small Pyralidae). Two pins may be needed to position the antennae correctly. Note also the two horizontal pins needed to keep the wings down: these pins are added after the wings have been positioned.

There are many species of very small Geometridae and Noctuidae, as well, which would come into the micro-moth size-range and should be double-mounted. When field-pinning moths, the first thing one does is place a simplified locality and date label at the head of the box. To use miunten pins, one should use a small forceps with finely ground flat tips, such as those sold for removing eyebrow hairs, since such forceps hold the minuten pins best. Field spreading is faster than using spreading boards in the field, but boards can be used if that is an option. In humid regions, the field method is more practical due to the difficulty of getting the spread moths dry enough to remove, so the small boxes can be more easily transported than more bulky spreading boards.

Later, when one returns home and the micro-moths have dried after a few days so the wings remain set, one very carefully removes the setting pins and puts these pins at

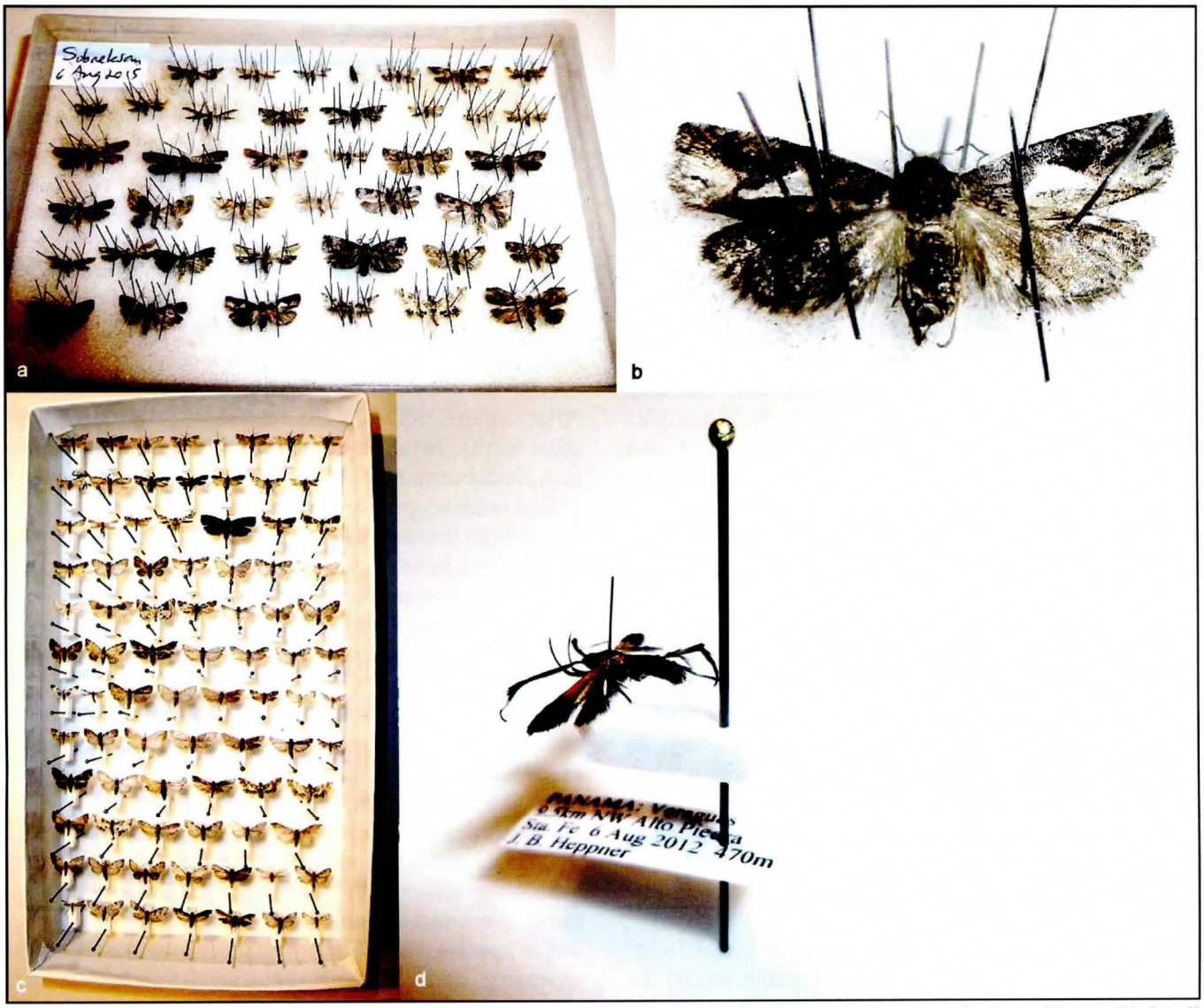

Fig. 2. Field and mounting techniques for micro-moths: a) field box with field spread micro-moths from Korea; b) detail of spread micro-moth (Tortricidae) using field pins; c) box of spread micro-moths on double-mounts ready to be labeled; d) finished double-mount of a micro-moth (Stathmopodidae from Panama), with locality label below.

the bottom of the micro-box for use on the next trip: care must be taken not to break off antennae, wings, or abdomens during this process. As with initial mounting, one may need magnifying lenses to be able to see these small moths easily: such magnifiers are sold as jewelers head lenses. The micro-moths are then taken and placed on double-mounts, which are composed of a small white block which in turn is pinned with a standard insect pin (e.g., a #4 pin), later the specimen has the locality label added below the block and in the same direction as the micro-block (Fig. 2d). A finished box of mounted moths (Fig. 2c) is then ready for adding the labels. Micro-moths should be placed on the micro-blocks with the legs directed back towards the main insect pin, not with the moth turned so the wingtips are in that direction.

We now use dense polythylene foam for the micro-blocks, by cutting long strips 3mm wide from the edges of such sheets (10mm thick) and then chopping the small blocks as 3mm wide blocks, thus each 3x3mm thick and 10mm long. Formerly, we used polyporous fungus, which also is white and has a firm grip on the pins, but with new conservation rules in England (the main source of this fungus), the supply of polyporous was reduced, so now we use dense plastic foam. The 10mm long micro-blocks are adequate for virtually all micro-moths: any moths too large for this would perhaps better be pinned directly with a standard insect pin (perhaps a #0 pin for the smallest), like all other larger moths. The only micro-moths that tend not to fit easily on such double-mounts are among the Pterophoridae, which often have very long abdomens. Moths with long legs are carefully placed so that the main insect pin is between the legs, which can then extend backwards somewhat beyond the micro-block.

Micro-moths should be pinned with the minuten pin so that the moth is about in the middle of the minuten pin:

when spread, the moth then has its minuten pin pushed well into the micro-block, the moth is then slightly above the block, and the minuten pin on the finished double-mount is not too high in relation to the head of the main insect pin (Fig. 2d). Finished double-mounts have the micro-blocks at a uniform height (ca. 15mm from the top of the insect pin), done by using a step-block, or wooden block with a hole at a set depth, so as each micro-block is "pinned" with the #4 insect pin one gets it at the same height on the pin. Another height for the locality label is also used, so the final product (Fig. 2d) has everything at a uniform height: this produces a museum-quality collection and makes for fine curation of the specimens.

The last step is to identify the specimens, which is a vast subject and not very easy in many cases. We still have huge numbers of undescribed species in the world, even in North America, especially among the smallest moths, so your specimens may well not yet have any available name. Identifying what family the moths are comes first, and these can then be sorted to all that look alike. A specialist may eventually have to help you to actually identify the species you have, but know that for many micro-moths one needs to study the head characters, wing venation, and even the genital characters in detail in order to know what the species is. Keeping your collection as numbers of "morpho-species" (i.e., as specimens which look alike and may be the same species), is fine to start with, all arranged by their correct family. A family key is available in three revised editions (see Heppner, 1996, 1998, 2003), but will soon be further revised and corrected for all the added families which have been discovered since then, although these families are all tropical and not found in North America.

Literature Cited

Heppner, J. B. 1996. Keys to families of Lepidoptera. *Tropical Lepidoptera*, 4 (Suppl. 3):1-28. (1993)

Heppner, J. B. 1998. Classification of Lepidoptera. Part 1. Introduction. *Holarctic Lepidoptera*, 5 (suppl. 1):1-148.

Heppner, J. B. 2003. *Lepidoptera of Florida. Part 1: Introduction and Catalog.* Gainesville: Fla. Dept. Agric. (*Arthropods of Florida*, Vol. 17). 656 pp, 55 pl.

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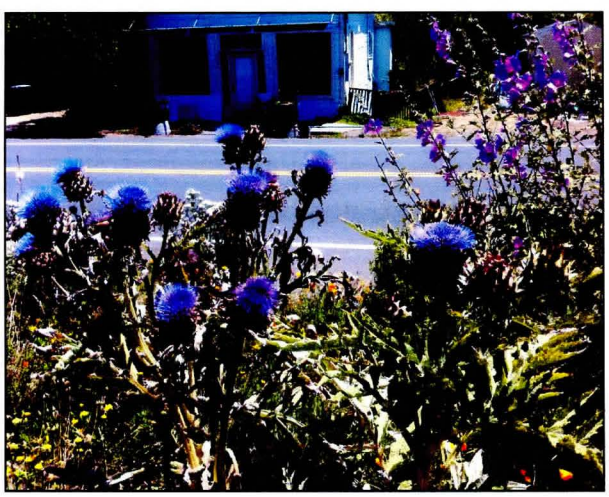

Artichokes (*Cynara cardunculus* var. *scolymus*)(Tomales, California, June, 2016)(Photo by Andrea Kass).

The artichoke (*Cynara cardunculus*) is native to the Mediterranean and was used as a food among the Greeks and Romans. The Greeks were perhaps the first to eat the leaves and flower heads and through cultivation improved its culinary value. Through the ages the artichoke was likely further cultivated and improved by the Arabs and eventually it was transported from Italy, to southern France in the 15th and 16th centuries finally arriving in the United States in the 19th century being transported by French immigrants to Louisiana and to California by Spanish immigrants. [Any butterfly/moth larva feed on this plant?]

https://en.wikipedia.org/wiki/Artichoke

HAIRSTREAKS OF ARKANSAS: *CALYCOPIS CECROPS* (LEPIDOPTERA: LYCAENIDAE)

BY

DAVID RUPE

Calycopis cecrops is a small hairstreak that is widely distributed in the eastern US and common throughout Arkansas, although it may be locally absent in some areas due to lack of suitable habitat and/or host plants. This hairstreak's wingspread typically measures about 7/8 to 1 ¼ inches across and it can be recognized by its white postmedian band that is bordered by red on the ventral wing surface (Fig. 1). The author has observed this butterfly throughout Arkansas' ecoregions and in virtually every county in Arkansas.

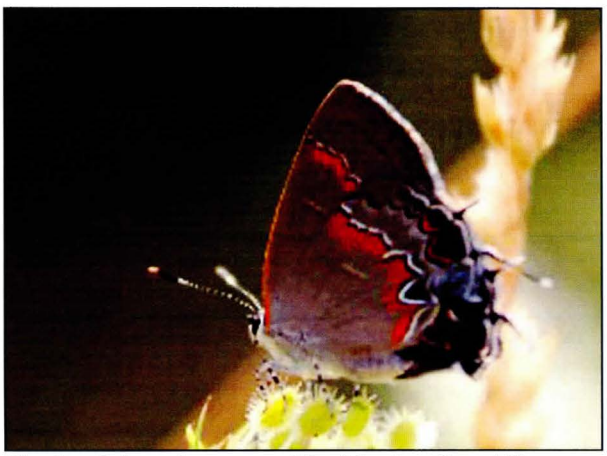

Fig. 1. *Calycopis cecrops* Washington Co., AR (July 2013).

The flight period of *C. cecrops* in Arkansas, based on the author's observations, is approximately late February-early November. It appears there are three broods in Arkansas (possibly four broods in southern Arkansas). The summer and fall broods are the most common, although it can be fairly common in early spring as well.

This hairstreak most commonly occurs in forest edges, disturbed areas, narrow right-of-ways, and similar habitats that support sumac (*Rhus* spp.), wax myrtle (*Myrica cerifera*), and oaks (*Quercus* spp.). The caterpillar reportedly feeds on fallen leaves of the above listed host plants; although, it is possible *C. cecrops* feeds on additional plant species in Arkansas (and elsewhere in its range).

The author has observed *C. cecrops* taking nectar from a variety of flowers, however, it seems to prefer small white flowers such as old man's beard (*Verbesina virginica*), dogbane (*Apocynum cannabinum*), thoroughwort (*Eupatorium* sp.), aster (*Aster* sp.), mountain mint (*Pycnanthemum albsecens*), yarrow (*Achillea millefolium*), and various additional species. This species is one of the most widespread and common hairstreaks in Arkansas, although it is probably often overlooked due to its small size.

Literature Cited

Opler, P.A. and V. Malikul, 1992. *A Field Guide to Eastern Butterflies*. Peterson Field Guide # 4. Houghton-Mifflin Publishers, Boston. 396 pages, 48 color plates.

Scott, J.A., 1986. *The Butterflies of North America: Natural History and Field Guide*. Stanford University Press, Stanford, CA.

Spencer, L.A., 2006. *Arkansas Butterflies and Moths*. Ozark Society Foundation, Little Rock, Arkansas.

(David Rupe, E-Mail: dmrupe@att.net)

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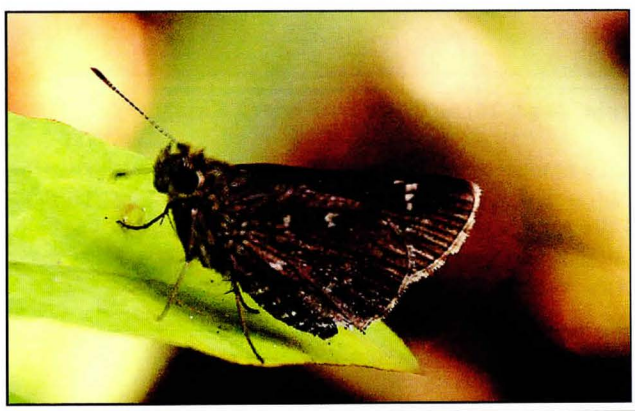

***Amblyscirtes belli* collected in the backyard of David Rupe (near Prairie Grove, Arkansas) (11-July-2016).**

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DONE AND DUSTED IN LOUISIANA – OR IS IT?

BY

CRAIG W. MARKS

On March 22, 2009, I was in Kisatchie National Forest (NF) in Natchitoches Parish, Louisiana, for my second outing of the season. It was a good day, 22 species including 7 Frosted Elfins, 1 Eastern Pine Elfin and 3 Sleepy Duskywings. Toward mid-afternoon I was winding up the trip with one last stop along the Longleaf Vista at one of the Caroline Dorman trailheads where equestrian riders park their horse trailers. There, across a side gravel road and down a slight incline into an open grassy area, I saw 7 dark brown skippers that I did not recognize (Fig. 1).

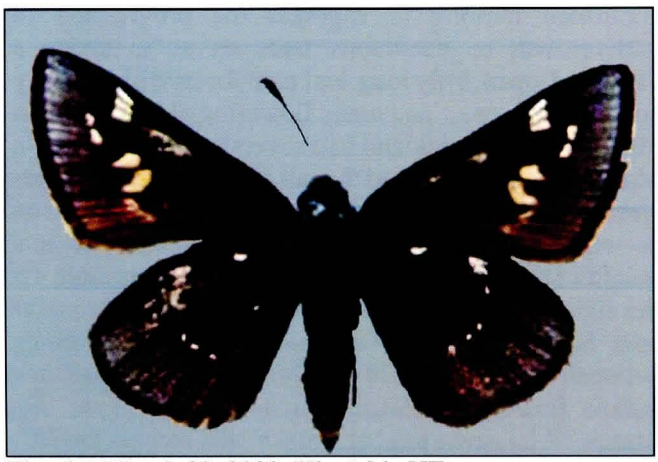

Fig. 1. March 22, 2009, Kisatchie NF, Natchitoches Parish.

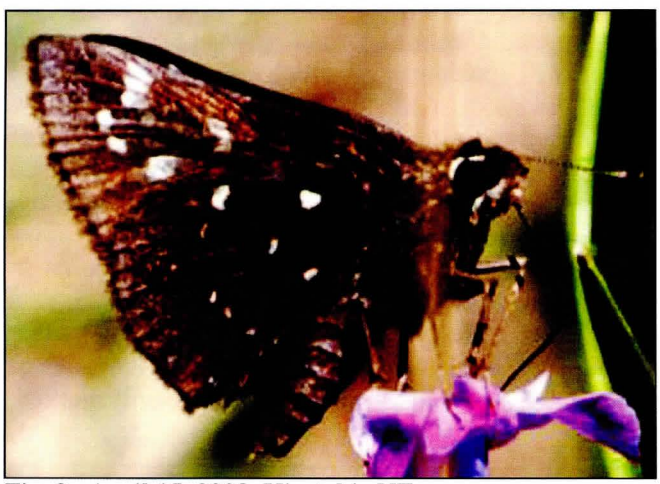

Fig. 2. April 15, 2008, Kisatchie NF, Natchitoches Parish (JFT)

Now, while I have not seen every skipper that has been reported from Louisiana, I had done my research and felt that I knew what was possible. When I got home, I checked several field guides that included Louisiana and still didn't see what I considered a match. It was not until I called my friend, Jeff Trahan (JFT), and explained what I had seen that I got a clue as to what my mystery skipper was. Jeff reported he had also seen a similar skipper at Kisatchie (Fig. 2). He suggested that I check the Cech/Tudor book as that he felt the skipper was *Atrytonopsis hianna,* the Dusted Skipper.

The Dusted Skipper is primarily chocolate brown with a "dusting" of white scales along the outer margins of the fore- and hindwings. Cech and Tudor described *hianna* as "taxonomically complex." They reported that two very different-looking races have been recognized, northern *hianna* and southeastern *loammi*. "Some argue these two variable forms are sibling species." The principal difference between *hianna* and *loammi* is the number of white, opaque spots, primarily on the hindwing, with *loammi* much more heavily spotted. The skipper is described as fairly large, especially *loammi*.

So I began to investigate, and what I learned was anything but clear. If you are a "lumper," there is ample support to call *loammi* a subspecies of *hianna*, but if you are a "splitter," there is almost equal support to call them separate species. For example, Scott referred to *loammi* as a subspecies, occurring in Florida and along the coast north to North Carolina and west to Louisiana, intergrading inland to *hianna*. He reported one flight northward, but many flights southward, from January to November in Florida. Howe stated *loammi* probably was a subspecies of *hianna*, representing an extreme SE population. It is double brooded in Florida with populations north to North Carolina and west to Mississippi, and a broad area where intergradations with *hianna* may occur. The NABA Checklist and English Names of North American Butterflies (2nd Ed.) lists *loammi* as subspecies of *hianni*.

Conversely, Klots considered *loammi* a separate species, describing the white spots on the hindwing as characteristic. However, he also noted *hianna* consistently has a single white spot near the base of hind wing, but in some, all spots are present. The BAMONA website lists *loammi* as a separate species with its range limited to North Carolina.

Emmitt described *A. loammi* and *A. h. hianna* as separate species, but then recognized some considered them to be the same species, differentiated by the heavy markings on *loammi*. The latter's range was given as along the North Carolina and South Carolina coast, with two broods, late March to early May and mid August. *Hianna* is described as more widespread throughout Virginia, North Carolina and South Carolina, single-brooded from mid April to mid June.

Then there are those which have hedged their bets. Legrand suggests, "(P)erhaps the chief separating factor between Dusted Skipper and the Loammi Skipper is the brood sequence," with the Dusted being single brooded. He further noted the Loammi Skipper, "tends to have numerous white spots scattered over the hind wing below ... However, some Dusteds can look quite strikingly spotted on the hind wing, one reason for the hesitancy of some entomologists to consider the Loammi as a separate species."

Brock and Kaufman listed the two as separate species, but they also acknowledged that some considered *loammi* to be a subspecies of *hianna*. They identified the overall range of *loammi* as along the coast of Virginia, North Carolina, South Carolina, Georgia, most of Florida, extending into the panhandle but not beyond. They describe it as similar to *hianna*, but on the hindwing it has a sharp white spot band curving outward. They also note *hianna* sometimes has variable white spotting below.

Harris noted that the Loammi Skipper was described in 1876, but he expressed some doubt that it was a separate species from *hianna*. He also referenced Bryant Mathers who had questioned the species distinctiveness of the Loammi Skipper (see below). Whether a separate species or a subspecies, Harris reported *loammi* had a wide range across Florida, but was virtually unknown in Georgia. In contrast, *A. h. hianna* had a wide range over that state.

Closer to home, in Missisippi, the following website, http://www.forestryimages.org/browse/detail.cfm?imgnum =2191043, listed the "Loammi Skipper" from that State, and included a picture of a specimen caught by Charles Bryson in 1974. Mather (1994) listed this skipper as present in Mississippi with no other information. However, in his 1958 article on the Butterflies of Mississippi, Mather discussed the complications presented by the series of specimens from that State. Those from the more southern portions of the State (Hattiesburg area) resembled *loammi* with well developed white, opaque spots on the hindwing, while others from more northern regions of Mississippi did not. If that were not confusing enough, he also noted some of the "northern" females had "traces of the spots on the hindwings beneath that suggested a trend toward *loammi*." In the end, Mather felt, "that on the basis of current criteria," it is proper to separate the two, but, as noted by Harris, suggested further examination.

Gayle Strickland, in an unpublished paper, *circa* the early 1970's, reported *hianna* from St. Helena and Natchitoches Parishes in Louisiana with virtually all records from March and April. Of interest to this analysis, 3 specimens had been caught in August in St. Helena, but Strickland expressed doubt that these represented a second, fall flight, speculating that they were, "sporadic early maturing individuals, rather than a reproductively successful second flight." Strickland's series from St. Helena Parish varied from "almost immaculate dark specimens to those with broad heavy white areas." Kil Roever, who collected a series of 76 of this skipper with Strickland, also reported the trend of males appearing more *hianni*-like while females in the same area possessed *loammi* tendencies (personal conversations). Vernon Brou had specimens from near Fluker in Tangipahoa Parish, also taken in the early `70's, with capture dates of April 15, August 4 and September 15. Some of Brou's fall specimens were lightly spotted with one bearing very little spotting.

The area in St. Helena where Strickland's specimens were found was owned by a paper company which used controlled burning to suppress the progression of undergrowth or deciduous trees so as to create a disturbed, open, hilly long-leaf pine forest with a "heavy cover of grasses . . . and many flowering plants." Within his field notes, Strickland had several observations. On March 22, 1969, he noted that all of the Dusted Skippers were in clearings in open, cutover piney woods, either on or within six inches of the ground. They flew at a height of between two to four feet above the ground. Of the eight he saw, he believed all were males. Two days later he saw another five. The males were patrolling between 11:00 and 12:30. At 3:30 he found a male at a yellow flower he identified as possibly jasmine. On March 28, he saw a total of sixteen, and then on the 30th, he saw 28. On that date, he noted the males seemed to defend territories until about 2:00 pm, but afterwards seemed to be patrolling. He took one specimen on *Andropogon*, a common field grass. On April 8, he collected 22 specimens, of which eight were females.

I was able to gain access to Gayle's collection. Two of the three specimens caught in August are depicted below. The dates of capture were August 5 (photograph not shown), and August 9, 1967 (Figs. 3 & 4). I also include a photograph of two specimens he caught in Kisatchie National Forest on April 4, 1970 (Fig. 5, next page). He actually caught numerous specimens that day. The two depicted are intended to show the range of difference from virtually no markings to heavily marked.

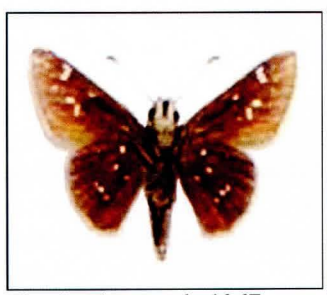

Fig. 3. August 9, 1967, St. Helena Parish

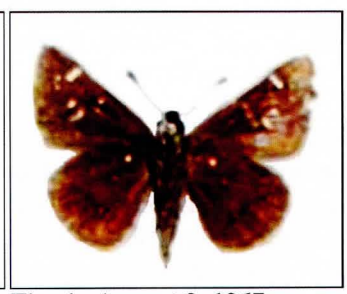

Fig. 4. August 9, 1967, St. Helena Parish

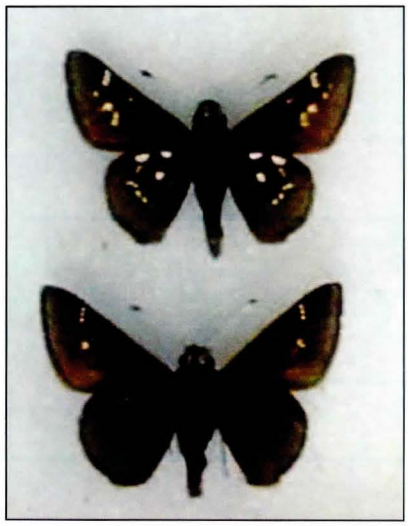

Fig. 5. April 4, 1970, Kisatchie NF

This species was listed in 2005 and again in 2013 as a species of conservation concern in Louisiana. It has been recorded in nine parishes, six parishes in the Cen-La region and three parishes in the Florida Parishes region of the State. Recent Louisiana records (primarily by Rosemary Seidler, Jeff Trahan and myself) have ranged from the last half of March into the third week on April. The earliest and latest this skipper has been recorded is March 17 (Rapides Parish) and April 21 (Natchitoches Parish). Exemplar records are as follows:

March 19, 2016, Kisatchie NF, Natch. Parish, 8 individuals (CWM);
April 9, 2016, Kisatchie NF, Natch. Parish, 3 individuals (CWM);
April 9, 2016, Kisatchie NF, Vernon. Parish, 2 individuals (DP);
April 16, 2016, Kisatchie NF, Rapides Parish, 3 individuals (CWM);
April 3, 2015, Kisatchie NF, Natch. Parish, 17 individuals (CWM);
April 8, 2015, Kisatchie NF, Natch. Parish, 35 individuals (JFT);
April 5, 2103, Kisatchie NF, Natch. Parish, 1 individual (JFT);
April 21, 2013, Kisatchie NF, Natch. Parish, 4 individuals (CWM);
March 17, 2012, Kisatchie NF, Rapides Parish, 7 individuals (CWM);
March 28, 2012, Kisatchie NF, Natch. Parish, 7 individuals (RS & JFT);
April 14, 2012, Kisatchie NF, Natch. Parish, 1 individual (JFT & CWM);
April 9, 2011, Kisatchie NF, Natch. Parish, 5 individuals (CWM);
March 20, 2011, Kisatchie NF, Rapides Parish, 1 individual (CWM);
April 3, 2010, Kisatchie NF, Natch. Parish, 2 individuals (JFT);
April 18, 2010, Kisatchie NF, Rapides Parish, 3 individuals (CWM);
April 25, 2010, Kisatchie NF, Natch. Parish, 7 individuals (CWM);
March 22, 2009, Kisatchie NF, Natch. Parish, 7 individuals (CWM);
March 29, 2009, Kisatchie NF, Grant Parish, 1 individual (CWM);
March 30, 2009, Kisatchie NF, Natch. Parish, 7 individuals (RS);
April 4, 2009, Kisatchie NF, Natch. Parish, 11 individuals (RS);
April 26, 2009, Kisatchie NF, Natch Parish, 2 individuals (JFT & CWM);
April 15, 2008, Kisatchie NF, Natch. Parish, 6 individuals (JFT);
April 8, 2006, Kisatchie NF, Natch. Parish, 4 individuals (JFT);
April 10, 2005, Gum Springs Road, Winn Parish, 1 individual (JFT);
April 4, 2004, Kisatchie NF, Natch. Parish, 1 individual (JFT).

Fig. 6. April 8, 2006, Natchitoches Parish (Photo by JFT)

Some of these specimens were clearly *loammi*-like with others, not so much. Individuals seen by Jeff in Natchitoches Parish in April of 2006 and 2008 were barely marked at all (Figs. 6 & 7); however, at the same locations in 2012 (April and March respectively) Jeff

Fig. 7. April 15, 2008, Natchitoches Parish (Photo by JFT)

found some very strongly marked specimens (see Figs. 8 & 9). I have had the same experience in the springs of 2010, 2011 and 2013 with some heavily marked and others lightly marked specimens, not only in the same location, but in the same year. Roever verbally reported catching a *hianna*-like specimen at Lake Ramsey Savannah Wildlife Management Area (WMA) in St. Tammany Parish on April 3, 2014, and Dave Patton (DP) found a *loammi*-like individual in Vernon Parish on April 9, 2016.

Fig. 8. March 28, 2012, Kisatchie NF, Natchitoches Parish (Photo by JFT)

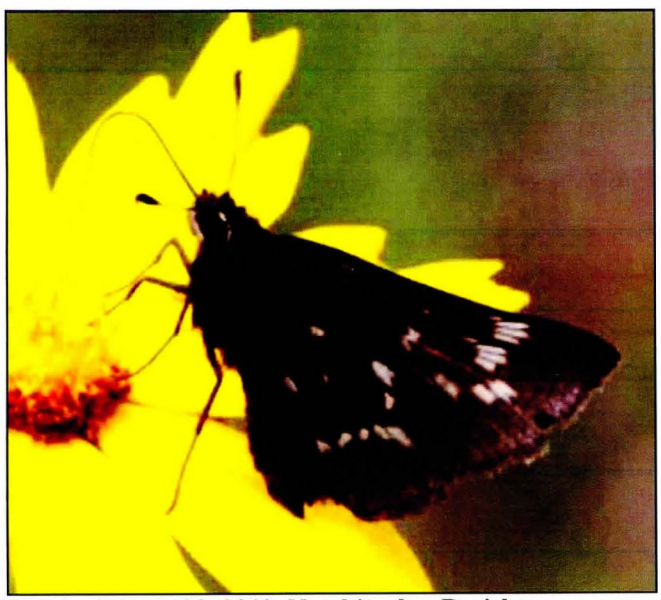

Fig. 9. March 28, 2012, Natchitoches Parish (Photo by JFT)

Were this not confusing enough, there are many intermediary specimens that are lightly marked (Fig. 10, as well as Figs. 1 & 2). In fact, my experience is that more of the specimens seen are lightly marked than boldly marked or not marked at all.

On April 3, 2015, while in the Kisatchie Unit in Natchitoches Parish, I saw a total of at least 17 very fresh specimens, both males and females. While the

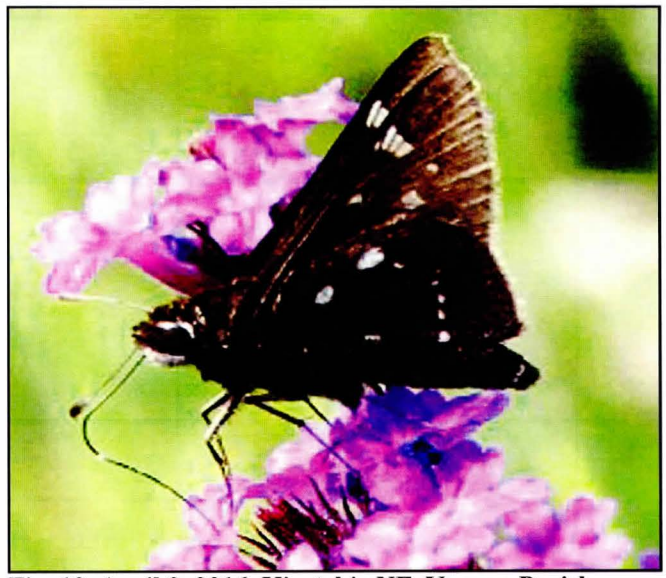

Fig. 10. April 9, 2016, Kisatchie NF, Vernon Parish (Photo by DP)

morning temperatures were in the upper 70's, the skies were mostly grey and it was windy. I did not start seeing the skippers until after about 12:00. Most were seen along forest roads, but some were in an open field filled with little bluestem. As Roever had experienced in St. Helena Parish, the males were *hianna*-like while the females were more like *loammi*-like in appearance. The females were primarily seen at flowers (yellow coreopsis, low-growing blue phlox, thistle and indigo), and the males were perched. While a couple of the males were perched on dead grass stems of little bluestem, most were seen at bare spots on the ground. I witnessed the males chasing each other, Horace's and Wild Indigo Duskywings and even Frosted Elfins, each time returning to its previous perch area.

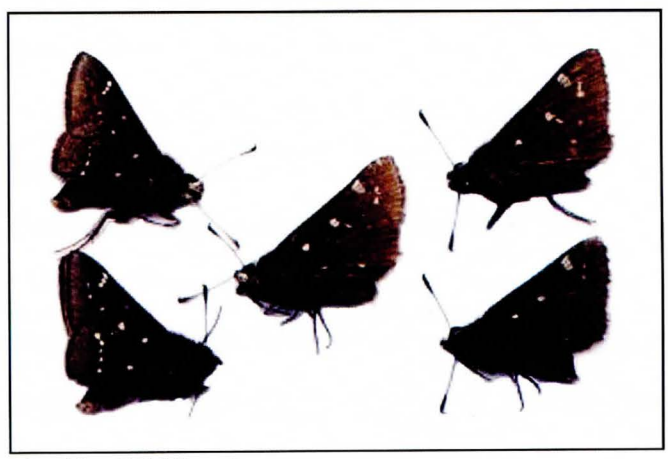

Fig. 11. 2016 Specimens

In 2016, I found Dusted Skippers flying in the Kisatchie Units of Natchitoches and Rapides Parish from March 19 to April 16. The picture above (Fig. 11) shows five specimens, those on the far left taken in Natchitoches Parish on March 19, those on the far right also from Natchitoches Parish on April 9. The one in the middle was from Rapides Parish on April 16.

As noted above, some of the referenced field guides indicate typical *loammi* is double brooded, whereas all *hianna* are single-brooded. Both Strickland's and Brou's collections provide evidence of a Louisiana fall brood, at least in the Florida Parishes of eastern Louisiana. That said, despite extensive canvassing of the Kisatchie units in the central Louisiana parishes of Natchitoches, Rapides and Vernon, a second brood has not been documented. While I don't profess to know what name is appropriate within the State for this skipper, I am of the firm belief that there is only one species in Louisiana, not two. In terms of habits, habitat, locations and flight timing, I have seen no distinguishing factors to suggest the presence of two species.

I wish to again thank Rosemary Seidler, Jeff Trahan and Dave Patton for allowing me to use their pictures and data as part of this article as well as Jeff's assistance in reviewing/editing the final version. I also must thank Kil Roever for sharing his field data and comments on the subject matter.

REFERENCES

Brock, Jim P. and Kenn Kaufman, 2003. *Butterflies of North America.* Houghton Mifflin Company, New York, NY. 384 pp.

Cech, R., and G. Tudor, 2005. *Butterflies of the East Coast: An Observer's Guide.* Princeton University Press, Princeton, NJ. 345 pp.

Emmitt, Randy, *Butterflies of the Carolinas and Virginias, Interactive CD.*

Glassberg, J., M. C. Minno, J.C. Calhoun, 2000. *Butterflies through Binoculars A Field, Finding & Gardening Guide to Butterflies in Florida.* Oxford University Press, New York, NY, 242 pp.

Harris, L. Jr., 1972. *Butterflies of Georgia.* University of Oklahoma Press, Norman, OK. 326 pp.

Howe, William H., 1975. *The Butterflies of North America.* Doubleday and Company, Inc., Garden City, NY, 631 pp.

Klots, A. B., 1951, fifth printing 1969. *A Field Guide to the Butterflies.* Houghton Mifflin Co., Boston, MA. 349 pp.

LeGrand, Harry E. Jr. and Thomas E. Howard, Jr., 2015. *Notes on the Butterflies of North Carolina,* Twenty-third Approximation. http://nature123.net/biodiversity.php

Mather, Bryant, 1994. *Field Checklist Butterflies of Mississippi.*

Mather, B. and K. Mather, 1958. *The Butterflies of Mississippi.* Tulane Studies in Zoology. 6:62-109.

Opler, Paul A., Kelly Lotts, and Thomas Naberhaus, coordinators., 2010. Butterflies and Moths of North America. Bozeman, MT: Big Sky Institute. http://www.butterfliesandmoths.org

Opler, P.A. and A. Warren, 2003. *Butterflies of North America. 2. Scientific Names List for Butterfly Species of North America, north of Mexico,* Gillette Publications, Fort Collins, CO, 80 pp.

Scott, J.A., 1986. The Butterflies of North America, A Natural History and Field Guide. Stanford University Press, Stanford, CA. 583 pp.

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Leucocoprinus birnbaumii was found growing in a flower pot in a home in Abilene, Texas, May 2016.

"In North America, this yellow mushroom is called the 'yellow parasol', 'flowerpot parasol', 'yellow houseplant mushroom', 'lemon-yellow lepiota', or 'yellow pleated parasol'.

The species was first published as Agaricus luteus by the English mycologist James Bolton who described and illustrated it from a hothouse near Halifax in 1785. Unfortunately, the name A. luteus had already been published for a different fungus, making Bolton's A. luteus illegitimate. Nonetheless, many popular North American books continued to use the name Lepiota lutea until the 1980s. In 1839 Czech mycologist August Corda described the same species from Prague where it was found growing in a greenhouse by a garden inspector named Birnbaum, hence the epithet birnbaumii.

Fruit bodies of Leucocoprinus birnbaumii are poisonous if consumed, causing significant stomach problems. The toxicity and yellow color of the mushrooms is from a set of alkaloids known as birnbaumins." (1)

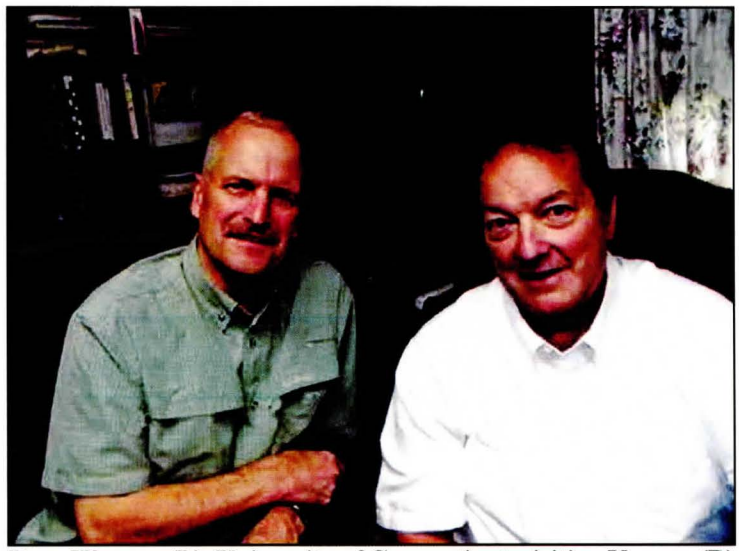
1) https://en.wikipedia.org/wiki/Leucocoprinus_birnbaumii

ENTOMOLOGICAL VISITORS TO VERNON AND CHARLOTTE BROU AT THE *ABITA ENTOMOLOGICAL STUDY SITE* - 2016

BY

VERNON ANTOINE BROU JR. AND CHARLOTTE D. BROU

Bill Mauffray (R), Director of International Odonata Research Institute, Gainesville, Florida, USA, visiting Vernon (L) & Charlotte (behind camera) on April 6, 2016.



Dave Wagner (L), University of Connecticut, visiting Vernon (R) & Charlotte Brou (behind camera) on May 29, 2016.

Jeffrey Slotten (L), Gainesville, Florida, visiting Vernon (R) & Charlotte Brou (behind camera) on May 21, 2016.

Kenneth Bosso (L), Baton Rouge, Louisiana, visiting Vernon (R) and Charlotte Brou (behind camera) on June 21, 2016. Ken is a retired engineer, who in recent years has been involved with promoting rearing of butterflies in the Baton Rouge area and being a go to source for numerous local butterfly enthusiasts.

(Vernon A. Brou Jr., E-Mail: vabrou@bellsouth.net)

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NEDRA RAMOSULA GUENÉE (LEPIDOPTERA: NOCTUIDAE) 1852 IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

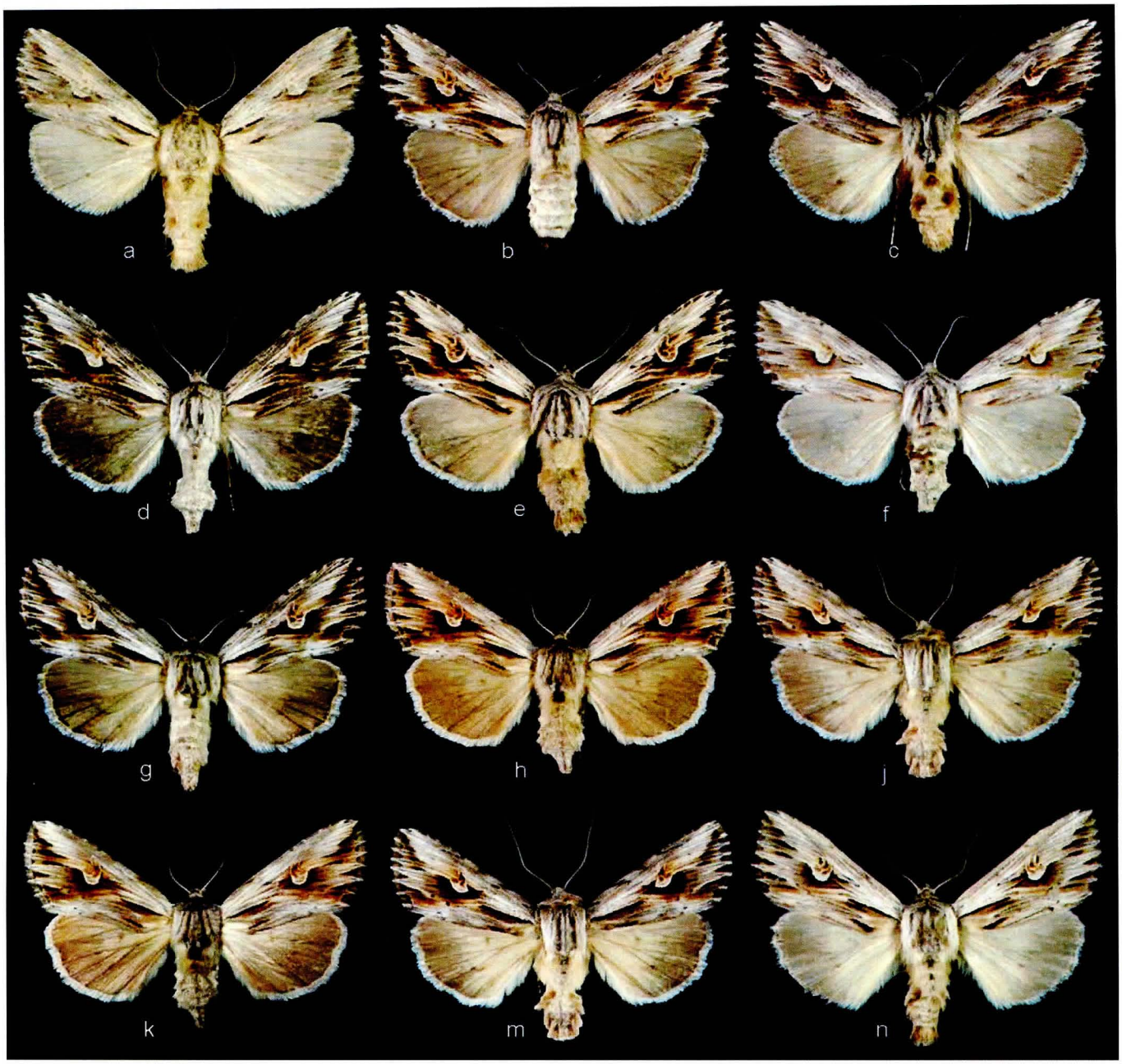

Fig. 1. ***Nedra ramosula*** phenotypes: a-n.

Nedra ramosula Guenée (Fig. 1) is one of four species of the genus ***Nedra*** Clarke listed by Lafontaine and Schmidt (2010). Guenée (1852) described this species as ***Cloantha ramosula.*** Forbes (1954) stated the range of ***ramosula*** to include Nova Scotia and Quebec to Wisconsin, south to Florida, Mississippi and Arkansas with two broods in late April to June, August, and September, southward also in March and December. Covell (1984) stated the range to include all of eastern North America, April-October in two broods. Heppner (2003) listed the range to include Nova Scotia to Florida, Wisconsin to Texas, in the months February - April, June, July, and September. Knudson & Bordelon (1999) listed ***ramosula*** in Texas.

In addition to ***Cloantha***, this species was previously placed in the genera***: Auchmis, Actinotia***, and ***Delta*** (Clarke, 1940). This author also listed the range to include eastern United States and Canada, the locations from data labels included: Arkansas, Connecticut, District of Columbia, Florida, Illinois, Kentucky, Louisiana, Maine, Maryland,

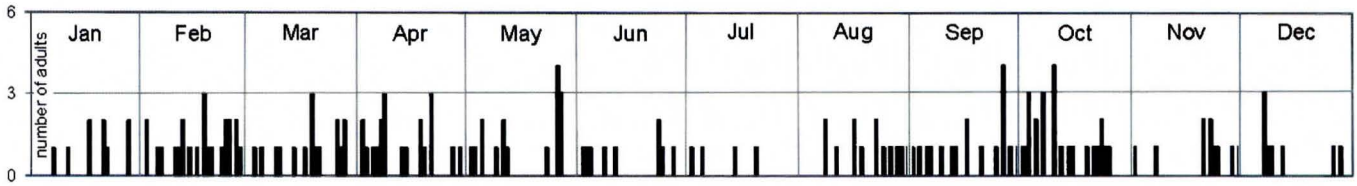

Fig. 2. Adult *N. **ramosula*** captured at sec.24T6SR12E, 4.2 mi.NE of Abita Springs, Louisiana. n = 170

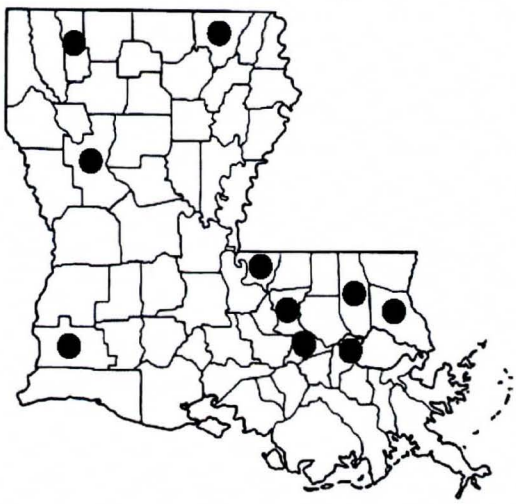

Fig. 3. Parish records for *N. **ramosula***.

Massachusetts, Mississippi, Missouri, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, Tennessee, New Brunswick, Nova Scotia, and Ontario. This same author also mentions a specimen from Arizona which he presumed to be this species. Powell and Opler (2009) did not mention ***ramosula*** in their publication on moths of the western North America.

In Louisiana, ***ramosula*** appears to have continuous broods, perhaps as many as six annual broods, adult specimens existing throughout all twelve months (Fig. 2). The parish records are illustrated in Fig. 3.

Literature cited

Clarke, J. F. Gates, 1940. A study of the North American moths formerly referred to *Delta* Saalmüller, with two new species (Lepidoptera: Phalaenidae). *Bull. Southern California Acad. Sci.* 39(1): 42-44.

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.

Forbes, W.T.M., 1954. *Lepidoptera of New York and neighboring states, Noctuidae, Part III*, Cornell Univ. Agr. Exp. St. Mem. 329. Ithaca, New York, 433 pp.

Guenée, Hist. Nat. Ins. vol.6, p. 114, pl. 9, fig.1. 1852 - Grote, *Bull. Buff. Soc. Nat. Hist.*, vol. 1, p. 83, 1873.

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. & C. Bordelon, 1999. *Texas Lepidoptera Survey, Checklist of the Lepidoptera of Texas 2000 edit.* Privately printed.

Lafontaine J.D., B.C.Schmidt, 2010. *Annotated check list of the Noctuoidea (Insecta, Lepidoptera) of North America north of Mexico.* ZooKeys 40: 1–239. doi: 10.3897/zookeys.40.414

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

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

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California Poppies (*Eschscholizia californica*), Tomales, California (June 30, 2016)(Photo by Andrea Kass)

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ACRONICTA BRUMOSA GUENÉE (1852) (LEPIDOPTERA: NOCTUIDAE) IN LOUISIANA

BY
VERNON ANTOINE BROU JR.

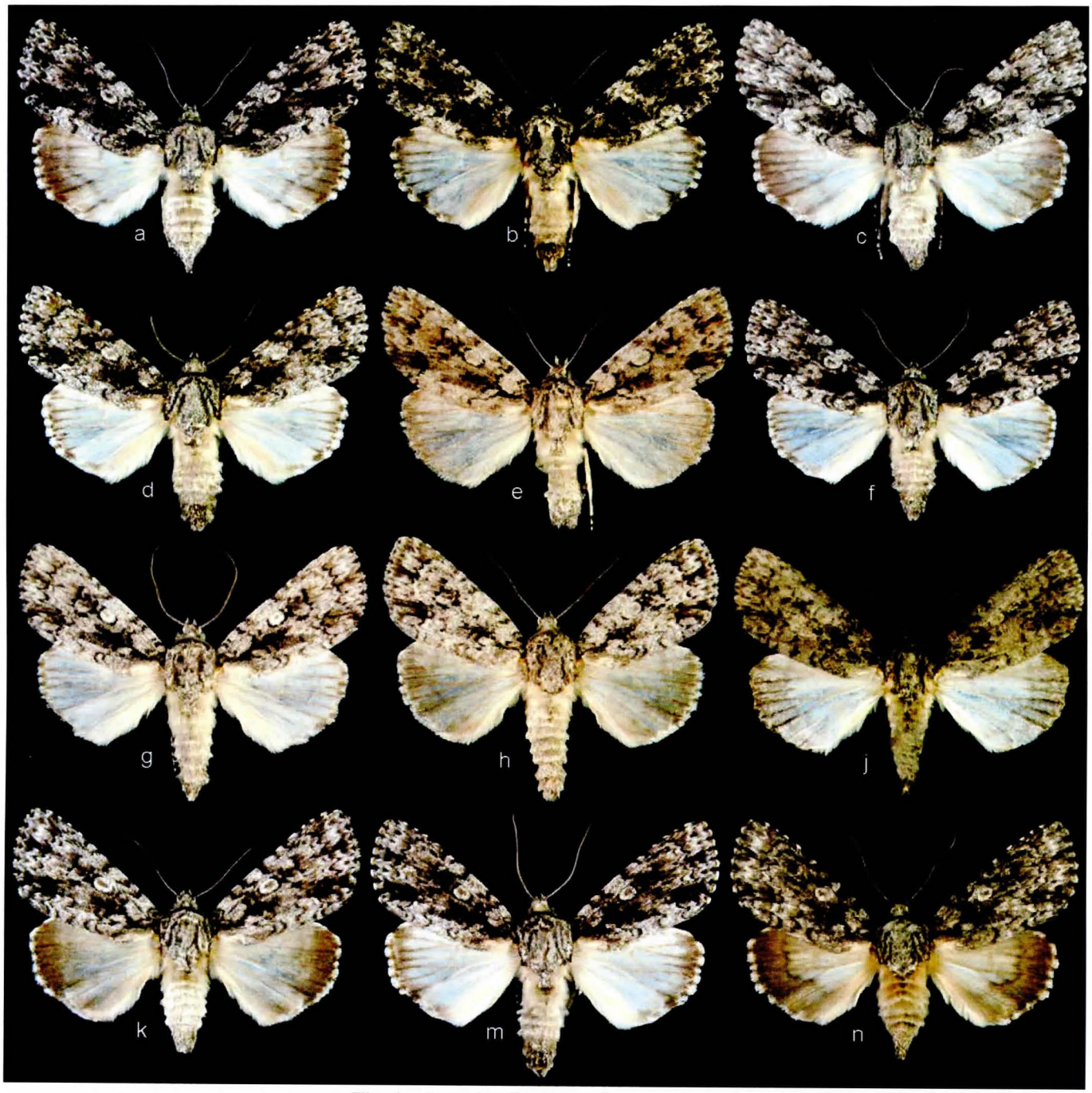

Fig. 1. ***Acronicta brumosa*** phenotypes: a-n.

The medium size noctuid moth ***Acronicta brumosa*** Guenée (Fig. 1) is reported to occur from New Jersey to Florida, and west, including Colorado (Forbes, 1954). Although 34 species of the genus ***Acronicta*** occurring in eastern North America were addressed by Covell (1984), he did not include ***brumosa***. Similarly, **Powell** and **Opler** (2009), in their publication on the moths of western North America did not mention ***brumosa***. Knudson & Bordelon (1999) listed ***brumosa*** as occurring in the state of Texas.

A. brumosa is highly variable in maculation, and amounts of gray, white, black, and brown scales, as illustrated in Fig. 1. The orbicular forewing spot is more often white in color, thus more often contrasting with the surrounding scale color, but not always.

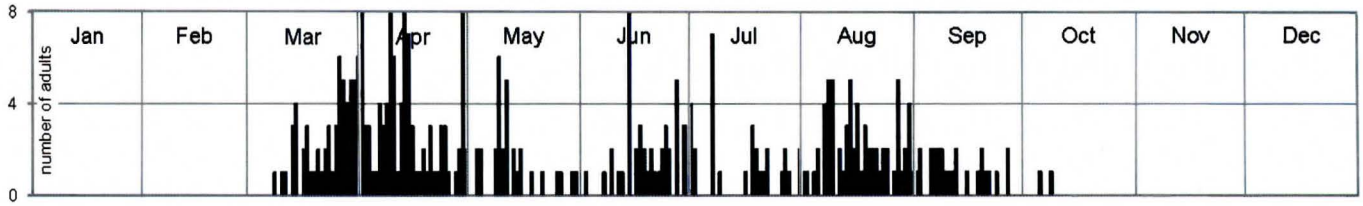

Fig. 2. Adult *Acronicta brumosa* captured in Louisiana. n = 358

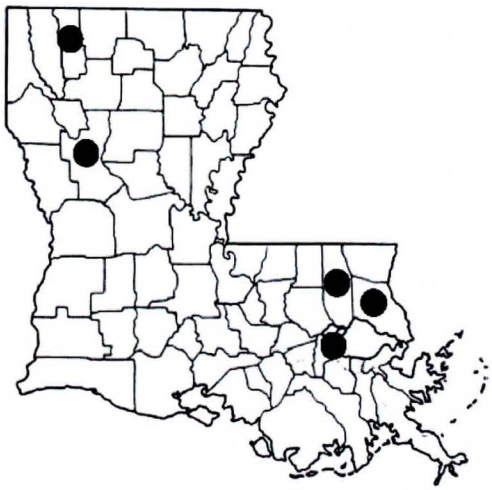

Fig. 3. Parish records for ***Acronicta brumosa.***

Heppner (2003) listed the range of ***brumosa*** to include New Jersey to Florida and Colorado to California in the months of February to April, and June to October. This author also listed hostplants to include eight different genera: Betula, Carya, Corylus, Hamamelis, Prunus, Quercus, Rubus and Salix.

In Louisiana, adult ***brumosa*** has been captured using mercury vapor light traps early March to early October, and has at least three annual broods (Fig. 2).

The parish records are illustrated in Fig. 3.

Literature Cited

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.

Forbes, W.T.M., 1954. *Lepidoptera of New York and neighboring states, Noctuidae, Part III,* Cornell Univ. Agr. Exp. St. Mem. 329. Ithaca, New York, 433 pp.

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.* Privately printed.

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

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

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One of many vineyards in Napa Valley, California (June 30, 2016) (Photo by Andrea Kass)

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A GRAND DAY FOR HAIRSTREAKS ON THE COAST OF GEORGIA

BY

JOHN A. HYATT AND LANCE A. DURDEN

On May 21, 2016, the authors met near the town of Darien in southern Georgia for a day's skipper recording in the coastal swamps and marshes. May is a prime season for the large swamp skippers, and we had visions of taking not only *Problema bulenta* and *Euphyes dukesi*, but even rarer targets such as *Euphyes arpa* and *bimacula*, and perhaps even *Poanes aaroni* and *Euphyes berryi*.

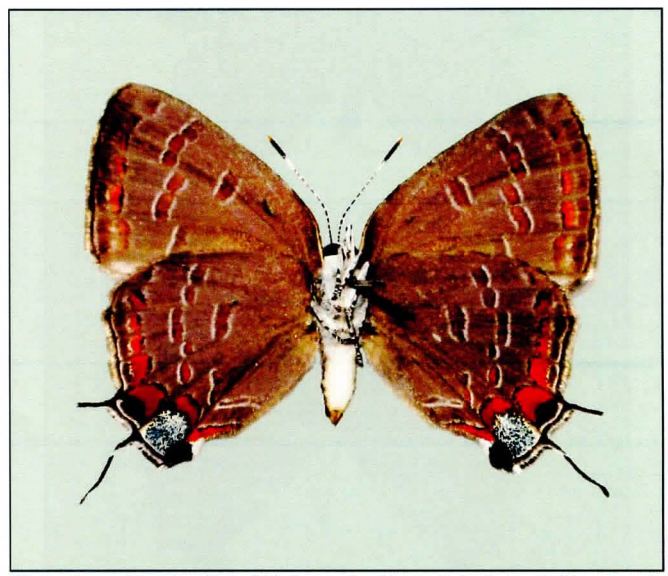
In the second half of May the pickerel weed (*Pondeteria caudata*) favored by the big skippers was at peak bloom, and we intended to inspect every ditch, marsh, and old rice field holding the skipper-attracting weed between the Florida line and points north of Darien. Hip boots, long-handled nets, and bug repellent were loaded and off we went. We hadn't yet purchased more drawers to accommodate the day's haul, but we were certain we'd need some bigger unit trays. Everything looked perfect!

It only took an hour or two to completely destroy our skipper hopes. Despite looking closely at many a blue *Pontederia* blossom — not a single solitary swamp skipper did we see! Even *Poanes viator*, a "weed" species usually present by the hundreds, was completely missing in action. In nearly twenty years of skipper hunting along this coast, we'd never seen anything like this. The winter of 2015/2016 was a mild one, and spring had been warm. Had all the skippers come and gone already? It's a mystery.

In hopes of salvaging something from the day, we remembered an area north of Darien where there were some chinquapin trees which might be blooming at this time of year, and decided to try to find them in hopes that the odd hairstreak or something might be there. Near the unincorporated settlement of Crescent in McIntosh county we came upon a chinquapin (*Castanea* sp., probably *pumila*) standing alone in the open quite close to the road, in full bloom and not too far from some mixed hardwood forest. We stopped for a quick look and were absolutely astonished — the tree was literally swarming with hairstreaks! We didn't see too many at first, but quickly refined our search images and started seeing the little dark triangles sitting on the white foxtail-like flowers. And every time we swung a net to take one, the net turned out to hold anywhere from two to four specimens, often of different species. Gently tapping a branch would send dozens of hairstreaks skyward, but they would quickly return to feeding.

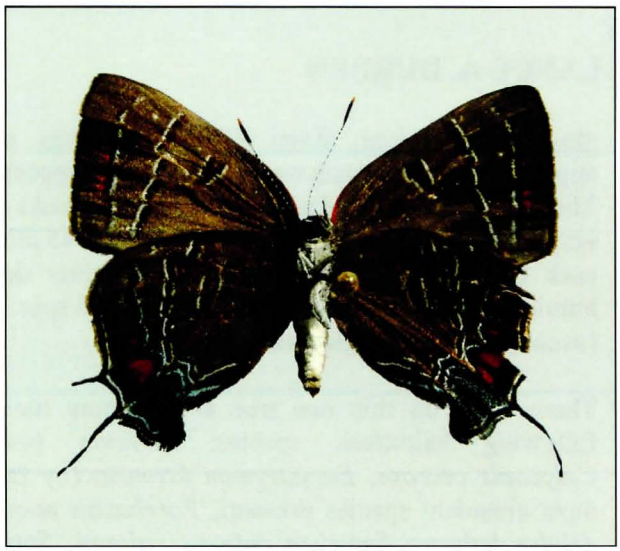
It was barely possible to identify any of the butterflies on the distant flowers, and we resorted to catching them for closer examination. Even blind net swings at an apparently empty branch would yield several specimens! The tree must have held a few hundred hairstreaks at the very least. In two separate sessions of about 45 minutes each (separated by a few hours of fruitless skipper hunting), together we identified or obtained specimens (usually series) of eight hairstreak species.

There were on this one tree at the same time the following hairstreak species: *Strymon melinus, Calycopis cecrops, Eurystrymon favonius* (by far the most abundant species present), *Parrhasius m-album, Atlides halesus, Satyrium calanus calanus, Satyrium liparops liparops*, and *Satyrium kingi*. We believe that this assemblage represents all of the hairstreak species which are known to fly on the Georgia coast at this time of the year — *Mitoura* and *Incisalia* have finished long before May, and things like *Harkenclenus titus* and *Satyrium edwardsi* and *caryaevorus* are not found in the immediate coastal area.

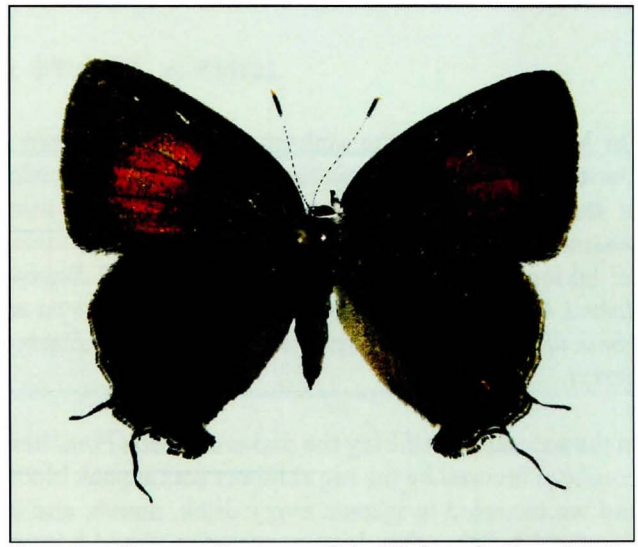


***Satyrium kingi*, GA: McIntosh Co., vicinity of Crescent, 21-V-2016, *leg.* Lance Durden.**

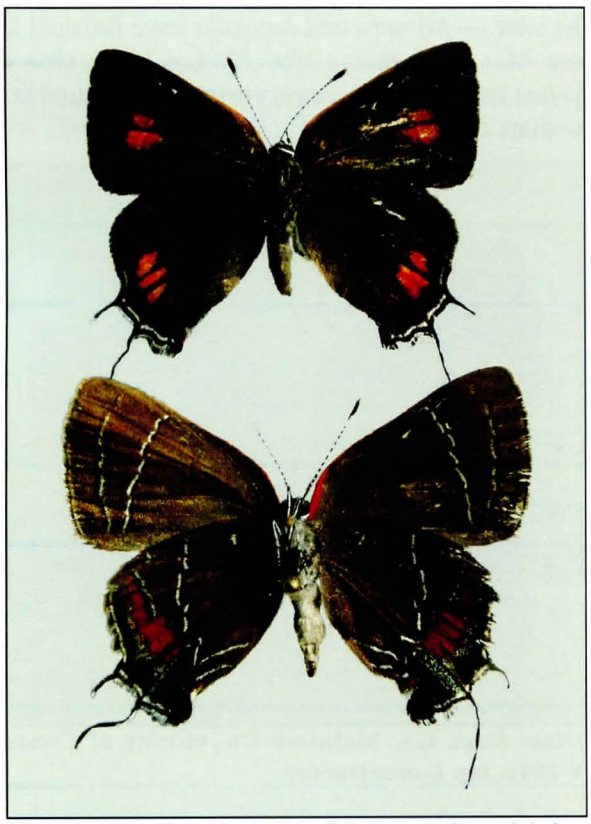
Lance took the only definite specimen of *Satyrium kingi*, obviously the best catch of the day. John found a specimen that seems intermediate between *kingi* and *calanus*; it may require dissection for determination. But *S. liparops liparops* is a fine thing to discover too, and beautiful fresh *m-album* and *A. halesus* are always a treasure. And even the abundant *E. favonius* is a beautiful hairstreak with a rather limited distribution. All our disappointment about the missing skippers faded into the background as we collected hairstreaks we sometimes go years without seeing, and they were all there in the same place at the same time!



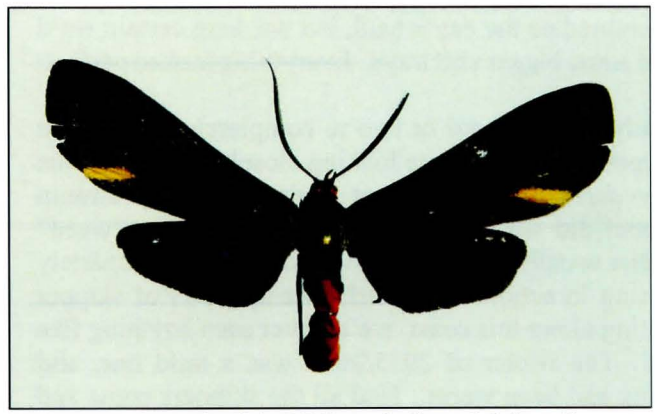
***Satyrium calanus calanus*, GA: McIntosh Co., vicinity of Crescent, 21-V-2016, *leg.* John Hyatt.**



***Satyrium liparops liparops*,, GA: McIntosh Co., vicinity of Crescent, 21-V-2016, *leg.* John Hyatt.**



***Eurystrymon favonius*,, GA: McIntosh Co., vicinity of Crescent, 21-V-2016, *leg.* John Hyatt.**



***Dahana atripennis*, GA: McIntosh Co., vicinity of Crescent, 21-V-2016, *leg.* John Hyatt.**

We found a few other chinquapins in the general area, but they were either passing out of bloom and held only a dozen or so hairstreaks, or were forest-edge trees grown tall and thin, with the lowest flowering branches far beyond our longest nets' reach.

In addition to the hairstreaks, the "magic" chinquapin held other butterflies (buckeyes, American painted ladies, one monarch, and *Erynnis* skippers), and we even took several specimens of the uncommon moth *Dahana atripennis* as "by-catch" when netting hairstreaks.

It will be very interesting to visit the same area at the same time in 2017. Will the skippers be back and the hairstreaks gone?

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(Article continues on next page.)

Lance Durden at the magical hairstreak tree, Crescent, McIntosh Co., GA.

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Caprock Canyon State Park near Quitaque, Texas (approximately 105 miles northeast of Lubbock, Texas)(May 30, 2016).

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I LOST MY SHORTS AT THE EL JO MOTEL (A DIARY OF A TRIP HOME FROM THE NATIONAL MEETING)

BY

KELLY RICHERS

So, what constitutes the actual range of the "Southern Lepidopterists' Society"? The International/National meeting of the Lepidopterists' Society was held at Florissant, Colorado, pretty much in the middle of the state, and on the trip to the meeting I stopped and had adventures north of there at Loveland Pass and Silverthorne (notably the bar where I spent the evening), but since that is not "southern" Colorado we will pass on the pre-meeting scenarios and I will share only what happened after the meeting, which itself was a great success.

Leaving the Florissant meeting on Sunday the 10th of July, I had only to wend my way from Colorado to Bakersfield in two days. Those were my instructions from my long suffering wife, and so the route was up to me. This being said, I had never been south on Interstate 25 further than Colorado Springs, so that route appealed to me as part the Old Santa Fe Trail, sort of. In addition I could collect at Greer, Arizona, one of my favorite spots, if I timed it right.

There were several things I had done differently for the Florissant meeting. I took seven trap setups and a mercury vapor setup, and was prepared to rotate four traps out every evening. (No, the math doesn't add up, but I was a PE major in college, after all). So, I set four traps on the 5th at Loveland Pass, the 6th at Divide, the 7th at Cottonwood Pass west of Buena Vista, and the 8th at Florissant. Chuck Harp accompanied me to all these locations, serving as guide and potential ambulance caller when I fell into a ravine or something. Much of the time was spent above 12,000 feet, where I discovered in Cottonwood Pass that my generator could not suck in enough air to operate properly, rendering my mercury vapor light the appearance of a bad film noir lighting not particularly attractive to moths. Probably not a real issue for most Southern Lepidopterist Society locations such as Florida, where the highest elevation is 345 feet...

The first important thing I did Sunday morning was pull out my I-Pad and type in "motels in Greer AZ", which looked to be roughly 11 hours away. I discovered a Motel 8 and made a reservation for the current night, Sunday, July 10. I have learned traveling that Sundays are usually available if you make a reservation the same day, but you need to make it early for Greer as Greer has been "discovered" by the Labradoodle crowd.

So, Colorado Springs being only some 35 miles to the east of Florissant, I headed there Sunday morning, and then down southward on Interstate 25. It became apparent fairly quickly why I had not been this way, as it seems pretty much to be in the middle of nowhere. The towns of Fountain, Rarista and Walsenburg rang no bells at all with me, and Lynn, Ludlow and Trinidad were not much but blots on the desert/high plains landscape, none of which looked collectable for butterflies in July, or a place to head for on your honeymoon. Lots of dirt, though.

Some hills appeared around Starkville, and I had hopes of finding some butterflies eventually. I had been advised to look around on the road from Interstate 25 to Angel Fire, taking a detour to Taos, where I could pick up a road south back to the Interstate.

Consultation with the Colorado experts resulted in a lot of nebulous information which indicated to me that they either had not collected lately in that area or were possibly in possession of some beverages when last they were there that might help them forget locations. "Kinda on the way" was how Todd Gilligan put it, I believe. It looked like there were collecting areas east of Angel Fire on the map, so the dearth of any real specific collecting areas did not dismay me too much.

It is about a million miles to New Mexico from Colorado Springs. Correction, it only seems like it, being only about 150 miles of nothingness. Finally, south of Raton, I took off on Route 64 toward Cimarron. Although the landscape never got any better and did not change for many miles, the names did get more "Western Movie Romantic" in nature. I crossed the Canadian River, which was interesting because I remembered the name from "Lonesome Dove" when Blue Duck (major bad guy) threatened Gus (major good guy) that he would do very bad things to him if he ever crossed it. These are the important facts that fill my mind.

However, the road to Eagle Nest (I told you the names got better) from Ute Park was a disappointment. Where I had been told to stop and look for butterflies was all State Park, as well as crowded and consisted of a canyon road with no place to park and look for anything except in designated park parking spots. From Eagle Nest there was no choice but to turn south to Angel Fire and on to Taos. Around Eagle Nest, I stopped at a meadow where I verified that the wind

was blowing at about 40 mph, rendering any collecting moot. When you can see Eagle Lake whitecaps that could sink the Posiden you know that collecting might be iffy.

However, as so often happens when you make no real plans, sometimes good things happen. Therefore, since I was fortunate, I will share the specific location where I found many daytime Lepidoptera. Yes, me, a moth collector, found butterflies (and a couple of day flying moths, of course).

The road, which actually bypasses Angel Fire completely, wound upward through mountains before reaching Taos, and here I was very successful in finding a place to look for butterflies and day flying moths. If I recall, being old and feeble minded, I have never previously collected in New Mexico, so anything I found would be potentially new, at least to subspecies, so I spent a fascinating two hours in a small vale at the first turn as you enter the mountains: Elliot Barker Trailhead (parking lot on south side, elevation 8530', 36'25'22.83N, 105'19'22.86W).

Fig. 1. Location of collecting area, west of Angel Fire (right to left: parking lot, stream, meadow dam).

Things did not start out well. I actually went across the road to look in what appeared to be a meadow of sorts, only to find nothing at all, and almost gave up completely, preparing to proceed on my way.

However, the other side of the road, where the parking lot is (southwest side), had a path for walkers and horses, and was completely different. There is a small stream that meandered down on your left as you go in, several wooded areas to the right up a small vale, a dam with water and the accompanying plants further up the trail, and several different areas of differing plant life. All in about a one mile hiking area.

I had a great time, caught some 50 specimens of at least 10 different Lepidoptera species and continued on my way. I have no idea where I went from there, following Google Maps through Taos onto a road south that should have been four lanes but wasn't, and several hours later going south found Interstate 25 at Santa Fe, then took it to I-40 at Albuquerque. Things there were very dry. No stopping then, until past Horace Springs, where I turned south on Route 117. Too dry there also.

This road, which winds gently through escarpment and mesa territory, is beautiful but bare and jagged with lava fields. At speeds far in excess of the posted limit I tore through the over 100 miles of bleakness, pulling up at the little town of Quemado, where I had to make a right hand turn. Doing so, I was stopped for speeding. When the officer approached me, he told me I was going 46 in a 40 mile zone. Contritely, I apologized, and was let off with a warning. (I bought doughnuts for my local sheriff's office when I got back as atonement and thanks for not getting a ticket). Unlike, I might mention, some friends who got tickets in Florissant and actually received the tickets…

Crossing the border into Arizona, I pulled up my I-Pad to check on the location of the Super 8 motel in Greer, not remembering it from previous trips, only to discover that Google Maps did not show it. After a few moments I brought up the original website where I located it, only to discover that Greer AZ Super 8 is in Greenville South Carolina. What the? Although I have been to Greenville, since it was nearing 6 pm., there was little chance that I would make it there, as I was speeding some 2500 miles away in the opposite direction. (Reference the 'old and feeble minded' part above…)

Some fumbling later, I found that at the El Jo Motel in Springerville there was a room for under $80. Since I was only a few minutes away, I stopped there when I arrived. There was an older lady who was very helpful, and rented me a room, to which I retired to call Greenville and try the forlorn hope of cancelling my reservation, which was going to be tough, since it was 9 p.m. there by now. Interestingly enough, the gentleman to whom I spoke said it happened all the time and graciously cancelled the reservation. Whether I will be charged is still to be known.

After a brief rest, on to Greer, some 15 miles and 30 minutes away. Having hit more than my share of wildlife while driving, I drove carefully, but saw nothing larger than a jackrabbit, which was safely off to the side of the road, cowering for his life. When I reached the end of the road at the south end of Greer it was only 7:30 or so, but already getting dark. Another Aha! moment. Since Arizona does not use Daylight Saving Time, the time is the same as in California, and

Fig. 2. A nice series of *Cercyonis oetus charon* (Edwards) and a *Limenitis w. weidemeyerii* Edwards (from New Mexico trip).

Fig. 3. *Colias philodice* females (3), *Aglais milberti, Vanessa virginiensis, Coenonympha tullia ochracea.*

Fig. 4. A nice series of *Lycaena helloides, Strymon melinus* (not sure of the subspecies here but not that important), *Pyrgus c. communis*.

it gets dark earlier as one is some 300 miles further east. Interesting, if you want to set traps at dusk. Probably boring otherwise.

So, among the wandering tourists and children and small Labradoodle like dogs I unloaded all seven traps, explained several times to mothers what I was doing, and set them up at the Little Colorado River. The traps were spread over about a mile in area so they were out of sight of each other. Retiring to the motel, I spent a serene and uneventful night, setting my little clock radio alarm for 5 a.m. due to the time issue. At that time I arose and packed everything up into the truck.

In the early morning mists at Greer there were only three gentlemen, all older, all walking dogs, when I picked up the traps, all of which worked properly during the night. Packing everything up, I prepared for the trip home, but returned to the El Jo Motel to change into cargo shorts and flip flops for the drive. Somehow my clock radio and sleeping shorts popped out of the duffel bag whilst doing this, unnoticed by me.

Three hours later, 150 miles away, I received a call from the motel lady, leading to the information that I had left these articles at the hotel. I told them to toss the clock radio and shorts, and continued on my way. Upon arriving home, I told my wife what had happened. She more or less expects me to have some disaster on the road, so this was small potatoes, and she didn't even blink an eye.

> After a few minutes of contemplation, however, she said, "Isn't 'El' Spanish?"
>
> "I suppose it is, yes," I replied.
>
> "Then wouldn't it be the 'El Ho' motel if pronounced correctly? You know, like Jose?"
>
> I could see where she was going. What could I respond? One can never respond to leaving one's shorts at the El Ho Motel.

The conversation soon dissolved into the expected hysterical laughter, so you can make your own assumptions. Regardless, I left my shorts there.

A story needs a moral, I know. The moral of this story is that exploring new areas are always fun, always an adventure, and you should always leave time to explore using local information. Thanks to the guys in Colorado for getting me to the general area where I could find great stuff in New Mexico.

Oh, and don't invite me anywhere for a couple of weeks. I need a new clock radio and new shorts.

Fig. 5. Left to right, top to bottom: *Oarisma garita* (2), *Piruna pirus, Polites origenes rhena* (3), *Callophrys affinis homoperplexa* (The Journal of Research on the Lepidoptera, Vol. 40, 2008, pg. 215), *Phyciodes tharos* "type B", *Chlosyne nycteis drusius* (2), *Plebejus icarioides pembina* and one dayflying moth at the bottom MONA 8127, *Parasemia plantaginis*. Names taken from Journal of Research on the Lepidoptera Volume 31, 1-2 Spring 1992 "New Mexico Butterflies, Checklist, Distribution and Conservation" by Steven Carry and Richard Holland .

(Kelly Richers, E-Mail: kerichers@wuesd.org)

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RETURN TO "LOUISIANA'S LOST WORLD"

BY

GARY NOEL ROSS

September 23-24, 2005
Hurricane Rita

"WHILE MIRACULOUSLY NO ONE IN CAMERON PARISH WAS KILLED, 38 OF ITS 40 CEMETERIES WERE BREACHED AND OVER 340 CASKETS AND THEIR REMAINS WERE TORN FROM THE GROUND AND SCATTERED INTO MARSHES, TREE TOPS, FIELDS, AND CANALS FROM AS FAR AS 30 MILES AWAY. THIS MONUMENT REPRESENTS SOME OF THE MOST TREASURED POSSESSIONS OF CAMERON PARISH. IT HAS BEEN A LONG JOURNEY FOR THEM, THEIR FAMILIES, AND THOSE THAT RECOVERED THEM. MAY THEY AGAIN REST IN PEACE. GOD BLESS THEIR FAMILIES."

(Inscription from stone memorial in front of Cameron Parish Court House, Cameron, Louisiana.)

Introduction

In the fall of 2009 I published "Louisiana's Lost World" in Louisiana Wildlife Federation magazine. The article detailed some of the more unusual biological aspects of the cheniers of Louisiana's second-largest, most southwestern, and least known of the state's political divisions, Cameron Parish. Cheniers are the unique elevated, narrow ridges that rise above the surrounding marshes commencing west of Vermilion Bay and running as far west as extreme eastern Texas. Because cheniers are ancient beaches, these physiographic features run in an east-west direction parallel to the present coastline. Cheniers comprise only about three percent of the land within the parish. These slivers of land were originally covered by dense forests of live oak and hackberry trees (the word chenier is derived from the French chênièr, meaning "place where oaks grow"). Historically, these elevated lands within the Cameron marsh lands were home to Cajun and Creole fishermen, hunters, and trappers. Then, too, because cheniers separate marsh lands from the waters of the Gulf, these ridges are responsible for the only recreational sandy beaches along the Gulf coast in Louisiana (except on Grand Isle, of course.)

Because of the singularity of the region, I devoted considerable time between 1988 and 2003 to research there. My investigations involved coastal erosion, migrating monarch butterflies, migrating birds, annual Fourth of July Butterfly Counts for the North American Butterfly Association (1992-2003), native milkweed plants, Louisiana iris, indigo plants, as well as the activities of local people such as fur trapping, and alligator hunting. In fact, one of my stories on the life history of a rare butterfly was the recipient of a national literary award.

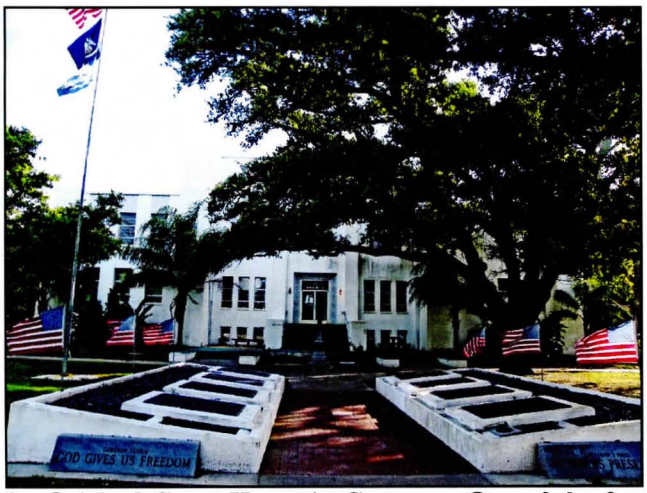
My next visits to Cameron weren't until April 2006 and April 2007. These were prompted by news of the massive destruction to the parish by Hurricane Rita on September 24, 2005. The Category 3 storm came ashore directly along the Cameron coast, bringing a ten-foot water surge that flooded the entire parish. My goal was to revisit my past research sites to learn if they bore any semblance to their past. My finding can be summed up in one word: DEVASTATION! Virtually all venues were unrecognizable. The entire Cameron area reminded me of a war zone. Most alarming was the absence of human beings, pet dogs/cats, and all wildlife —nary a wadding bird, alligator or snake. An alien silence enveloped all. Eerie.

1. Stone memorial to the Hurricane Rita disaster. Text is reproduced as a quote preceding the INTRODUCTION.

But Mother Nature was not through venting her rage. September 13, 2008, 2:10 AM, CDT. Ike, a Category 2 storm, made landfall near the Louisiana/Texas line. Although Cameron did not sustain a direct hit, the parish was on the most dangerous eastern side of the eye. Ike brought a wall of water estimated at twenty-two feet in

height to the Cameron area. Flooding reached 30 miles inland. Much of the area did not drain for the following two weeks. What had not been destroyed by Rita just three years earlier was now rent asunder.

Fearing the worst, I didn't revisit Cameron until May 23, 2016. Because this was my 76 birthday celebration and I was feeling nostalgic, I wanted to learn the status of one of my favorite areas of the state. I spent four days (May 23-26) in and about the municipality of Cameron. My comments follow.

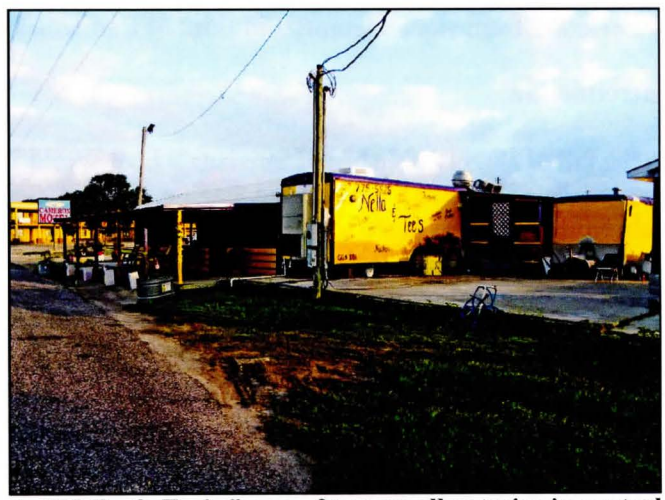


2. Original Court House in Cameron. One of the few buildings that survived Hurricane Rita (2005) and Hurricane Ike (2008). Town rests on one of the widest cheniers (ridges) in southwest Louisiana.

General

In the wake of both Hurricane Rita and Hurricane Ike, a new paradigm emerged for Cameron Parish. With escalated costs for rebuilding (higher insurance, structures must be at least 12 feet above sea level), the majority of residents in the Cameron area did not return after Ike in 2008. As of my visit in 2016, the town of Cameron itself was still but a shadow of its former self. With rubble cleared and many foundations of previous buildings covered by greenery, the community appeared as a pioneer settlement. In 2010 the population of Cameron Parish was recorded as 9,600. The present figure, however, is estimated by authorities to be close to 6,800. Of this, the lower part of the parish is estimated to contain only about 1,500 resolute residents. This means that of the state's 64 parishes, the second-largest in area has the state's smallest population. For visitors, amenities in the parish seat continue to be few: a single motel (without a restaurant but with a small eatery near by), a single gas station with a small food mart, and a "Family Dollar" store. An on-demand ferry service across the Calcasieu River to the western half of the parish and the LA/TX border has been restored. But Cameron's small satellite communities of Oak Grove and Creole are still struggling.

3. Renovated Cameron Motel in center of town. Although flood water reached the second floor during the latest hurricanes, the motel was renovated and is back in service.



4. "Nella & Tee's," one of two small eateries in central Cameron. The small establishment is adjacent to the Cameron Motel and serves three meals daily.

On the other hand, much of Grand Chenier has rebounded. And Holly Beach, which was totally obliterated by both Rita and Ike, has been reconstructed—actually better than before thanks largely to wealthy outsiders who have seized the opportunity to purchase beachfront vacation property in this so-called "Cajun Rivera." Cameron's fish and shrimp industries are functioning well whereas the oil industry is still struggling—not only from hurricane damage but because of the industry's national decline.

Likewise, much of the marsh lands have recovered. I did note, however, that many of the small bodies of freshwater were now becoming heavily overgrown. Two culprits were proliferating: American lotus (*Nelumbo lutea*), a large leaved, yellow-flowering species, and a small, floating exotic (Brazilian) aquatic fern named giant salvinia (*Salvinia molesta*). The latter was beginning to form mats, which according to residents, can become quite thick before the first frost. Masses such as these deplete water of oxygen. In the spring,

5. New Cameron Parish School Board Educational Conference Center across from the Cameron Motel. Current ordinances specify that all new construction be at least 12 feet above sea level.

6. Ferry crossing the Calcasieu River. The river separates lower Cameron Parish into east and west divisions. The ferry operates on demand with a $1.00 fee for west-bound traffic (east-bound traffic is free). Sea birds usually follow the ferry to catch fish disturbed by the churning water.

7. "The Ferry Landing" is a wholesale seafood distribution center located at the site of the old small ferry dock to Monkey Island in the Calcasieu River. The island is no longer inhabited and so ferry service has been discontinued. In the past Monkey Island supported a good population of antelope horn milkweed (*Asclepias viridis*), a host for the monarch butterfly, especially important during the spring trans-Gulf crossing.

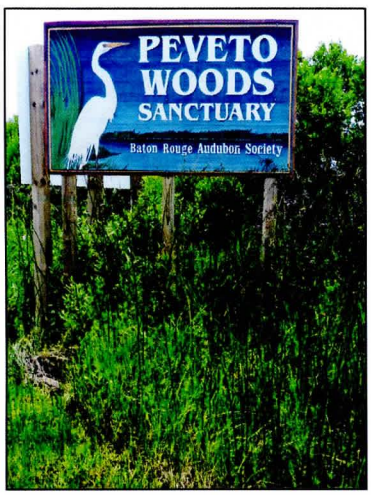
8. Old docking site for the small ferry to Monkey Island. Venue is now used by fisherman to unload their catch. Monkey Island is on the horizon.

9. Reconstruction continues on Holly Beach, a community that was obliterated by hurricanes Rita and Ike.

10. Shrimp boat docked at the original ferry dock to Monkey Island. Great place to observe gulls, terns, and the state's official bird, the brown pelican (*Pelecanus occidentalis*) as fishermen discard bait and unwanted catch. Monkey Island is in background.

11. Newly constructed luxury vacation home on Holly Beach. Many of the new residents are from out of state. Occupancy is usually limited to weekends, holidays, and summer months. The community is being endearingly touted as the "Cajun Riviera."

12. Legend same as Fig. 11 on left.



13. Entrance sign to Peveto Woods Sanctuary operated by the Baton Rouge Audubon Society. The sanctuary contains a grove of live oak and hackberry trees that have proven to be an important rest stop for migrating Neotropical song birds and monarch butterflies during their annual trans-Gulf flights. The no-fee refuge is immediately east of Johnson Bayou. Hurricanes spared many of the older live oak trees but deposited at least a foot of sand throughout the sanctuary. Smaller vegetation was severely impacted but is now recovering.

14. New interpretive pavilion at Peveto Woods Sanctuary.

15. Gray or winter grape (*Vitis cinerea*) is a native and invasive sun-loving vine that is covering many of the oaks bordering the grove. The plant "exploded" after the hurricanes of 2005 and 2008. However, birds enjoy feeding on the summer-fall small berries.

16. Pasture immediately east of the Peveto Woods Sanctuary. In the past, the land used to be grazed by cattle, and contained good colonies of *Asclepias viridis*. Today the area is no longer grazed but is mowed annually. In 2016, common wildflowers included Indian blanket/firewheel (*Gaillardia pulchella*), Texas tickseed (*Coreopsis lanceolata*), lazy daisy (*Aphanostephus skirrobasis*), and horsemint/spotted beebalm (*Monarda punctata*). I could locate no butterflies and no milkweed plants.

however, the newly sprouted plants provide excellent spawning grounds for various aquatic animal life.

Erosion

An easily observable example of coastal erosion lies between Holly Beach and Johnson Bayou. Over the decades, Louisiana Highway 82 periodically has had to be relocated farther inland. Today the coastal chenier has completed been washed away. As a consequence, the highway is now located on landfill within the soft soils of the flanking marsh. Although the rock breakwaters installed in the 1990s to slow wave action have helped, the problem continues. And as mentioned previously, Peveto Woods Sanctuary lost approximately 130 feet since 2005 and 2008.

17. Beach/chenier erosion adjacent to Louisiana Hwy. 82 west of Holly Beach. This southern highway to Texas has had to be periodically moved inland into the marsh due to extensive erosion.

18. Little Chenier, most northern of present-day cheniers. Prickly pear cactus (*Opuntia* sp.—on hill and inset) is common in the sand/shell soils of cheniers.

During earlier visits I inquired as to the existence of a wooded chenier with erosion severe enough to topple trees into the Gulf. In addition, I was interested in observing a relatively undisturbed/wooded chenier that could serve as another location for the rare falcate orangetip butterfly.

Fortune smiled in the personage of Jennings Clark. Jennings was the manager of the Rutherford Motel in Oak Grove. The small motel was convenient, comfortable for folks interested in hunting, fishing, crabbing, or just wishing to relax on nearby Rutherford Beach. Because Jennings was a Cameron native, he was familiar with what locals called Hackberry Ridge. This minor ridge was situated about 4-5 miles east of Oak Grove, south of Grand Chenier, and had some tree cover. The signature chenier was accessible only by foot, horse, or ATV via a beach route beginning at Rutherford Beach. The trek, of course, had to take place during a daily low tide and optimally, a neap tide in the lunar cycle. Additionally, a shallow rivulet and a mud flat, the outlet and estuary of Lower Mud Lake, had to be crossed. The flow was minimal during dry weather but dangerous at other times. Jennings possessed a small three-wheel ATV and eagerly volunteered his services. So, in May of 1991, on a day when all conditions were favorable, Jennings and I set out for Hackberry Ridge.

19. Prickly pear cactus growing along road on Little Chenier. Recent heavy rains have caused water to puddle along roadside.

Admittedly, I was apprehensive. But the nearly hour-long trip proved exciting, safe. The highest section of the ridge was about 6-8 feet above high water line and supported a thicket of medium-sized hackberry trees and colonies of prickly-pear cactus (*Opuntia* sp.) because of the sand/shell soil. But the situation was undeniably precarious: uprooted trees—some skeletonized, some still fresh—and other greenery (including cacti) were strewn haphazardly along the sandy beach and within the shallow offshore water. There could be only one conclusion: the Gulf was rapidly eating its way into the chenier. While tragic, the scenario provided an opportunity to acquire dramatic photographs. A walk about the hackberry woods revealed no *Cardamine* plants (host for the falcate orangetip butterfly). I did,

however, come across an old tin shack that Jennings identified as an abandoned cattleman's shelter from a time when cattle were grazed in the venue.

20. Cow grazing in flooded marsh on Chenier Perdue, south of Little Chenier. Cameron's cattle have adapted to grazing in wet pastures.

21. New trailer residence in Johnson Bayou. Note the kaleidoscopic display of spring wildflowers as noted in Fig. 16.

The following year, May 1992, I revisited the vanishing ridge. This time I was alone and on foot. Crossing the narrow foot-deep rivulet and mud flat proved no problem: I simply removed my shoes/socks and rolled up my pants. Even though only a year had passed, I estimated that the shoreline had regressed 3-4 feet. I left convinced that Hackberry Ridge was in deep trouble. (Photos pages 197 and 198)

In 2016 I could not trek to Hackberry Ridge. I feared for the worst. But an interview with Phillip "Scooter" Trosclair, III of the Rockefeller Wildlife Refuge proved cathartic. "Scotter" informed me that the higher portions of the ridge—west of the Mermentou River and Joseph's Harbor— still persist. "Scooter" shared aerial photos of the region to document the status of the ridge and how the shoreline had receded since 1998. Seems as if the area I had visited in the 1990s had experienced a shoreline recession of between 500-600 feet. But east of the Mermentau where the ridge barely extends above sea level, erosion has been more on the order of 56 feet per year. Since this is refuge land, officials are quite concerned. "Scooter" stated that since 1920, the refuge has lost approximately 15,000 acres of marsh—a poignant example of how cheniers slow Gulf intrusion.

Live Oak Trees

Live Oak Trees Live oak trees (*Quercus virginiana*) on the cheniers are noteworthy. None other than John James Audubon (1785-1851), the celebrated nineteenth century artist/naturalist, is credited to having referred to the coastal oaks as "the best anywhere." Even as late as 1988, the massive oaks on Grand Chenier were reported to form a canopy over seven-and-a half miles of LA Highway 82. But all that has gone. High winds coupled with root damage from saltwater intrusions have taken their toll. The area is punctuated with skeletons of what were former stately monoliths. But a number of sizable oaks survived hurricanes Rita and Ike—including the seemingly indomitable behemoth I had photographed in 2007 for my 2009 story. On September 6, 2013, that very specimen was memorialized as entry #7235 in the roster of the Live Oak Society of Louisiana Garden Club Federation. This storied specimen exhibits an official girth of 30 feet, 7 inches (trunk diameter is a little over 9.5 feet); the estimated age is 800 years. While the trunk is enormous, the canopy is not. Periodic hurricanes over the centuries have wrested many of tree's larger branches. Nevertheless, even though the tree does not exhibit the same statue as, say the "Angel Oak" of John's Island, South Carolina, the Chenier Perdue Oak still deserves our homage. (Photos pages 202 and 203)

22. Newly constructed house on Little Chenier. Most residents on this narrow, elongate ridge did not return to rebuild. This landowner rebuilt but decided to market the property.

Within the Peveto Woods Sanctuary (a facility of the Baton Rouge Audubon Society) near Johnson Bayou, a small grove of small to medium size oaks still persists.

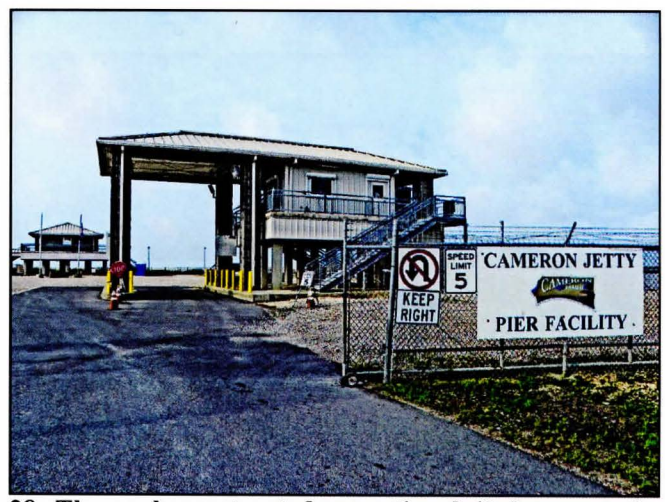
23. Stump of live oak downed by a past hurricane and burned by a marsh fire.

24. Skeleton of a live oak killed by a past hurricane.

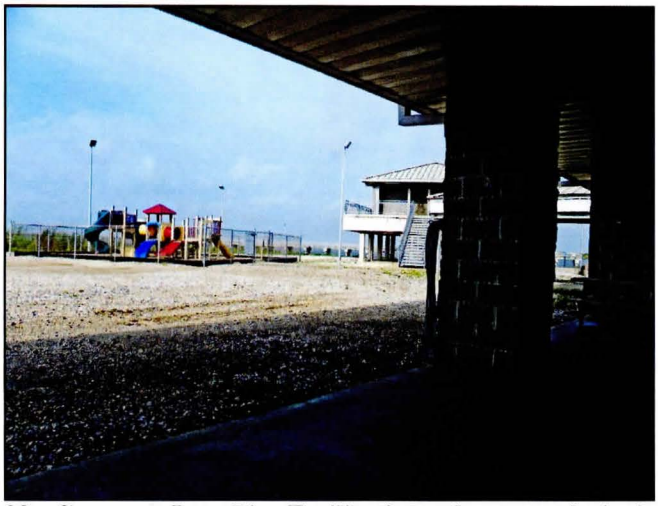
25. Live oak on edge of Little Chenier. High water in marsh is intruding onto chenier.

26. Live oak tree on edge of marsh and road on Little Chenier. Oaks on the cheniers often are misshapen due to winds from frequent hurricanes.

27. An impressive new residence on Chenier Perdue. Home site is surrounded by marsh but has a functional hummingbird and butterfly garden at the entrance to the long driveway.



28. The newly constructed recreational site known as the Cameron Jetty Pier Facility. This is the newest tourist facility post Rita/Ike. It provides single-day to multiple-day accommodations for locals and visitors.



29. Cameron Jetty Pier Facility from the covered picnic area.

30. Cameron Jetty Pier facility. An observation tower for shaded viewing.

31. Cameron Jetty Pier Facility. Various walkways to view marsh, river, beach and fishing spots. Walkways are wheelchair friendly.

32. Cameron Jetty Pier Facility. View of salt marsh tidal flats that in the past were habitat for the western pygmy blue butterfly (*Brephidium exilis*). However, in May 2016, I could locate no individuals.

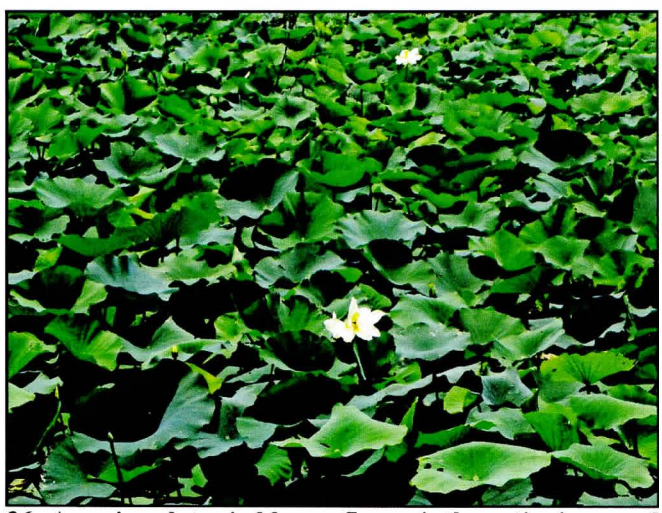
33. Cameron Jetty Pier Facility. Crushed stone walkway accesses beach for recreation.

34. Wildflowers in a field adjacent to a helicopter transport company on Grand Chenier. Annual mowing/burning encourages an intensive spring bloom. I observed only one butterfly: common buckeye (*Junonia coenia*).

According to Dave Patton (sanctuary official), the two previous hurricanes moved the coastline approximately 130 feet inland. Furthermore, the massive tidal surges accompanying each hurricane deposited a foot or so of sand inland, and that covered most low growth. Most of the larger and newly planted oaks survived. Lower vegetation is returning, too. The increased sunlight in and around the grove, however, is promoting the growth of invasive vines such as gray grape (*Vitis cinerea*), muscadine (*Vitis rotundifolia*), Japanese honeysuckle (*Lonicera japonica*), and pepper vine (*Ampelopsis arborea*). From a butterfly perspective, I observed several clumps of purple passionflower (*Passiflora incarnata*), the host for the Gulf fritillary butterfly (*Agraulis vanillae*). Indeed, I observed six individuals of this butterfly near its hosts.

35. The large-flowered American lotus (*Nelumbo lutea*) and the small aquatic fern giant salvinia (*Salvinia molesta*). Both are now common in open freshwater venues. (Inset is giant salvinia.)

The oaks of the cheniers provide migrating songbirds in the fall a staging ground before their launch southward across the Gulf waters. In spring, these same trees provide avian migrants with their first rest and feeding stop following their long trans-Gulf flights from tropical climes. Monarch butterflies, likewise, utilize the oaks in a similar fashion in both fall and spring (see below).



36. American lotus in bloom; flower is the nation's second largest.

In 2013, a group of volunteers led by Bob Thibodeaux of "Acorns of Hope" began planting small oaks on Grand Chenier in hope of initiating a replacement generation of trees. The group also is trying to encourage residents to respect their unique heritage of living treasures. From a human perspective, the oaks throughout the centuries have served to buffer hurricane-force winds, thus protecting land and human life.

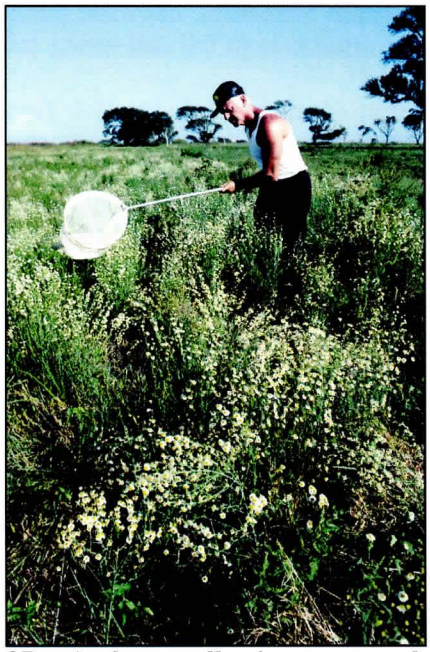
I conclude that although an actual forest of live oak trees is no longer, enough trees survive in small groves and as individuals to be of great value to birds, monarch butterflies, miscellaneous wildlife, and humans.

Monarch Butterfly, Milkweeds, and other Flowering Plants

Between 1988 and 1994 I was able to document that monarch butterflies (*Danaus plexippus*) utilize many of the groves of live oak trees on the cheniers as night-time roost before they launch out south over the Gulf of Mexico (the butterflies often pause on offshore oil and gas drilling rigs and production platforms when weather is inclement). In the spring, monarchs again take advantage of the tree cover to rest before continuing farther northward. At the time I coined the phrase "Trans-Gulf Express" to describe the phenomenon.

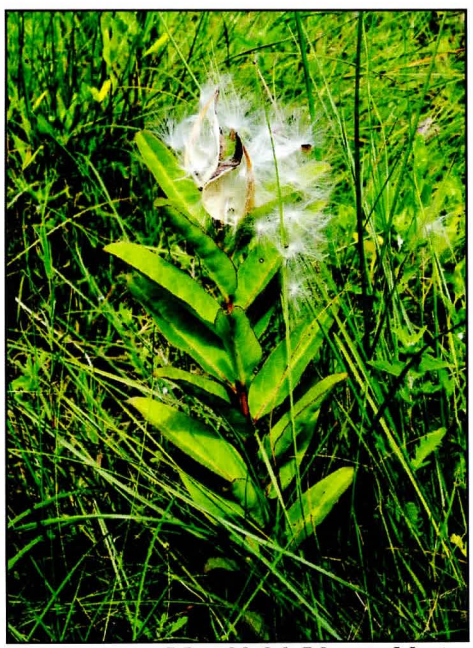
Cheniers are important to monarchs in other ways, too. For example, in fall the butterflies take advantage of the abundant colonies of Mexican devil-weed (*Chloracantha=Aster=Leucosysris spinosus*). The plant is a Texas species that has colonized open and waste areas in only four parishes in southwestern Louisiana (Acadia, Cameron, St. Mary, Vermilion). Leaves of this species are reduced to tiny spines, relegating most photosynthesis to the conspicuous green stems. Plants are fall-blooming perennials. Flowers have outer white petals and central yellow reproductive parts. And what a butterfly magnet! The October flowers proved to be irresistible to migratory monarchs as well as a small, day-flying, moth that is black with a red collar (aposematic coloring, I presume).

I identified the moth as the yellow-collared scape moth (*Cisseps fulvicollis*), family Arctiidae, subfamily Ctenuchinae. In 1992 I secured the assistance of an out-of-state organic chemist to analyze the flowers for traces of pyrrolizidine alkaloids (PAs)—compounds known to occur in milkweed butterflies, and theorized to aid in reproduction and possibly as deterrents for predators. The chemicals are sequestered from nectar sources, principally from species within the plant families Asteraceae, Boraginaceae, Apocynaceae, and Fabaceae. The results of analysis were inconclusive, attributable

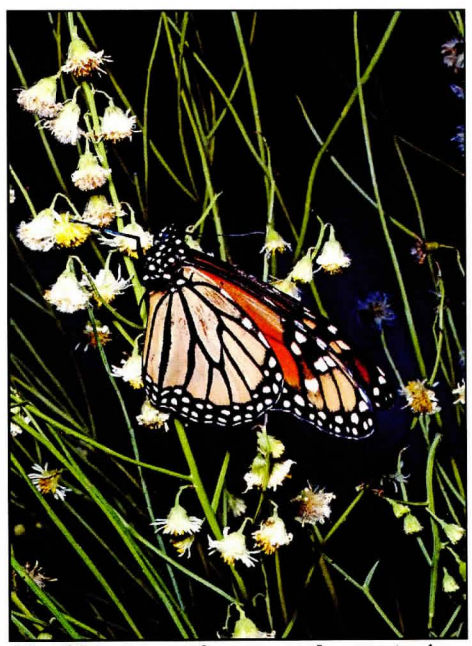


37. Author collecting monarch butterflies for banning in pasture east of Peveto Woods Sanctuary. Field was populated with abundant colonies of Mexican devil-weed (*Leucosysris spinosus*), a western aster. Leaves are reduced to tiny spines. Flowers in the fall are butterfly "magnets" and may contain pyrrolizidine alkaloids (PAs)—compounds theorized to aid in monarch reproduction and possibly as deterrents for predators. PHOTO: November 1991.

38. In the past, Monkey Island nurtured the largest concentration of antelope horn milkweed in the area as seen here growing along the main roadside on the island. In 2016, the island was inaccessible to me, but several shrimpers assured me that the roadsides were overgrown with heavy vegetation. I assume milkweed has been crowded out. PHOTO: May 1993.



39. Between May 23-26, I located but a single specimen of *Asclepias viridis*. The plant, in seed, was growing in a pasture off Davis Road accessed from the center of Cameron. On May 25 there was no indication of leaf damage from caterpillars.



40. Close-up of monarch nectaring on Mexican devil-weed. PHOTO: November 1992.

to an insufficient sample. Nonetheless, I am of the opinion that the asters do aid the butterflies with chemicals either for defense or in reproductive pheromones. [Note: Mexican devil-weed is cultivated as an important nectar plant in the butterfly gardens at the NABA National Butterfly Center in Mission, Texas.]

Many of the open areas of the cheniers in the past were inhabited by the native antelope horn or spider milkweed (*Asclepias viridis*). (According to "Atlas of the Vascular Flora of Louisiana" four other species of milkweeds have been recorded from Cameron Parish. I assume that these data are from the more northern/higher lands.) The plants were usually low growing and in pastures or along roadsides. For example, the pasture immediately to the east of the Baton Rouge Audubon Society's Peveto Woods Sanctuary had a good colony of *A. viridis*. The pasture was grazed by a small number of cattle. Since Rita and Ike, however, no cattle have returned although the pasture is mowed once each fall.

Another good venue for milkweeds in the past was the pasture lands owned by the Davis family near the East Jetty Woods—accessible from Davis Road.

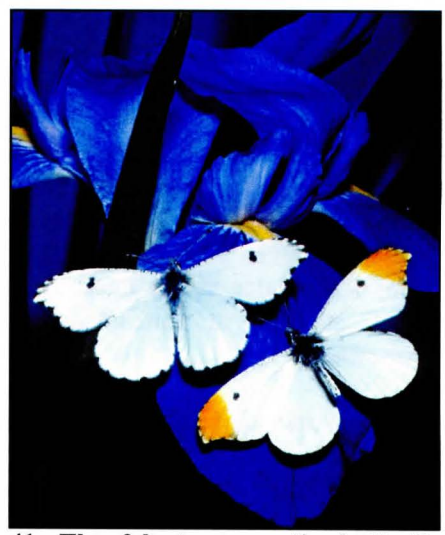
Before Hurricanes Rita and Ike, however, the highest concentration of milkweeds, was on Monkey Island, a spit of land within the Calcasieu River. The sparsely inhabited island was accessed by a small ferry from a dock near the center of Cameron. The milkweeds were concentrated along the mowed roadside that traversed the island. On several March / April excursions I observed larvae of both monarchs and queens (*Danaus gilippus*).

Regrettably, in 2016 I could locate but a single specimen of *Asclepias viridis* within the entire Cameron region. The plant was growing on the edge of a chenier in a pasture off Davis Road near the East Jetty Woods recreational area, barely a half-mile south of the heart of Cameron. The plant was in seed, and so easily recognizable. (I did not collect any seeds in order to give the plant the best chance for propagating itself.) Because there was no leaf damage, I conclude that no monarch larvae had fed on the specimen. Equally regrettably, I could not visit Monkey Island. The recent hurricanes had destroyed all residences on the island, and so ferry service was discontinued. With no human presence, I was told that vegetation was reclaiming the island. The wharf near the center of Cameron was now the headquarters of "The Ferry Landing," a bait shop and seafood market. One of the owners, Kay Picou, advised me that I could not access the island because there is now no place to dock. I assume, therefore, that the largest concentration of milkweeds from the past now had been smothered out by rampant vegetation. With the virtual absence of host plants on the cheniers, the spring monarch migrants must travel farther north to begin their first new generation. How this may affect the eastern population of the monarch is certainly a matter of concern. [Note: In the winter of 2014-2015, the number of monarch butterflies within North America plummeted from a previous high of 600 million in 1996-1997 to 35 million—a 95 percent reduction. But in the winter of 2015-2016, the species rebounded to 120 million—a good sign although still only 20 percent of its former self.]

That said, many of the open areas of the cheniers were ablaze with wildflowers: Indian blanket or firewheel (*Gaillardia pulchella*) and Texas tickseed (*Coreopsis lanceolata*) dominated many roadsides (especially between Cameron and Oak Grove) as well as on sunny lands that had been mowed or burned the previous fall/winter. Additionally, lazy daisy (*Aphanostephus skirrobasis*), a low-growing white/pink daisy, as well as horsemint/spotted beebalm (*Monarda punctata*) added their hues to the kaleidoscopic displays. Albeit on a smaller scale, the Cameron roadsides reminded me of the high profile spring color extravaganzas in the Texas Hill Country. I was disappointed, though, in that the plants were attracting virtually no butterflies.

Falcate Orangetip Butterfly

As mentioned earlier, I spent considerable effort monitoring the ecology of the falcate orangetip butterfly (*Anthocharis midea*) a small delicate species within the family Pieridae, subfamily Pierinae (whites). That detailed work was initiated in March 1991 and has been published elsewhere—see "Orangetips Die Hard in Louisiana" and "Butterfly Wrangling in Louisiana." (The latter was the recipient of the John Burroughs Association's Annual



41. The falcate orangetip butterfly (*Anthocharis midea*) was a rare resident in the past on several cheniers in the Cameron area. The species is a spring ephemeral that breeds on another spring ephemeral, bitter cress (*Cardamine pensylvanica*). Male (lower right) and female (upper left) are courting on a Louisiana iris (*Iris giganitcaerulea*) on Little Chenier. PHOTO: March 1992.

42. Female falcate orangetip poised to lay eggs on host, *Cardamine*. Little Chenier. PHOTO: March 1992.

43. Larva of the falcate orangetip on its host, *Cardamine*. The caterpillar feeds exclusively on flower buds, flowers, and young seed pods, and mimics the stems and petioles of the plant. Patch of hackberry woods off Davis Road. PHOTO: April 1992.

44. Pupa (chrysalis) of the falcate orangetip camouflaged as a thorn amongst lichens and thorns of a young honey locust tree (*Gleditsia triacanthos*). Little Chenier. PHOTO: April 1992.

"Award of Recognition for Outstanding Published Natural History Essay in 1995.")

In overview, the falcate orange tip is: (1) unfamiliar to most butterfly aficionados in southern Louisiana because the species is more characteristic of northern, upland forests with distinct winters; (2) an extreme spring ephemeral, flying at best for a week or two usually in March when vegetation is just beginning to green; (3) has but a single generation per year, spending nearly 12 months—or even 24, 36, or 48 months—in a quiescent pupa; (4) females utilize hosts that include ephemeral spring annuals in the mustard (cabbage) family (Brassicaceae).

During work with migrating monarch butterflies in Cameron in March 1991, I was surprised to discover several colonies of *Anthocharis midea,* within a few hundred feet of the waters of the Gulf of Mexico. Habitats were small patches of woods on Little Chenier, the Front Ridge near Cameron (Davis Road), and the Front Ridge west of Johnson Bayou. The dominant vegetation consisted of hackberry (*Celtis laevigata*), honey locust (*Gleditsia triacanthos*), and young live oak trees. These micro-habitats proved ideal: shade during the hot summers for cattle and in early spring, shade and extended moisture for the butterfly's host, bitter cress (*Cardimine pensylvanica*)—a diminutive wild mustard that is an ephemeral common spring annual. The shade is also important for the bitter cress plants—especially the shaded shallow hoof prints of cattle. These shallow depressions are able to sustain moisture longer than surrounding areas. And it is these microhabitats that provide nurseries for bitter cress. Amazingly, the only bitter cress plants that were robust enough to host one or two falcate larvae were those plants growing in old, moist hoof prints. The larvae, which feed on the tiny flower buds and seed pods (not leaves), are thin, pale green with lateral white and black stripes—adapted to mimic the morphology of their hosts. Without the shaded woods with their moisture-laden cattle hoof prints, I doubt if any bitter cress plants would survive long enough to mature to serve as an adequate food source for butterfly larvae. As such, *Anthocharis* and *Cardamine* exist in what ordinary would be a hostile environment. Fascinating example of co-evolution between two quintessential ephemeral species.

When I rechecked *Anthocharis* habitats in April 2006, all of my research sites suffered severe tree damage. By this time, all debris had been bulldozed into huge piles for burning. Then in 2016, the areas were cleared and converted into cattle pastures. Absent these traces of woodlands, there no longer were shaded cattle trails with shallow, damp depressions—the unique micro-habitats for host plants and their larval butterflies. Consider, too: Both hurricanes roared ashore in September, a time when the butterfly would be its pupal diapause. Each chrysalis mimics a thorn, and is usually affixed to a low tree limb or trunk of a lichen-laden hackberry or locust tree. The site must be shaded and reasonably protected during the entire year from human or natural intrusions other

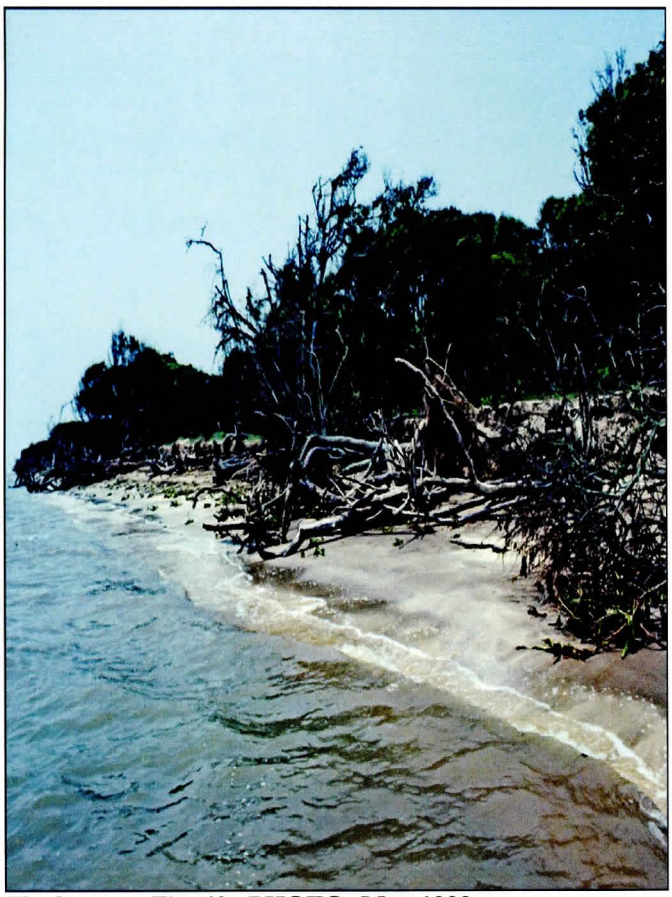
45. Part of Rutherford Beach is now restricted as an official spring nesting area for the least tern (*Sternula antillarum athalossos*), a federal and state protected bird sponsored by the National Audubon Society and the American Bird Conservancy.

46. Rutherford Beach near Oak Grove on Oak Grove Ridge. Access is from Louisiana Hwy. 82 and 27. Beach is popular for sports, while the adjacent canals and marshes are popular for crabbing and fishing.

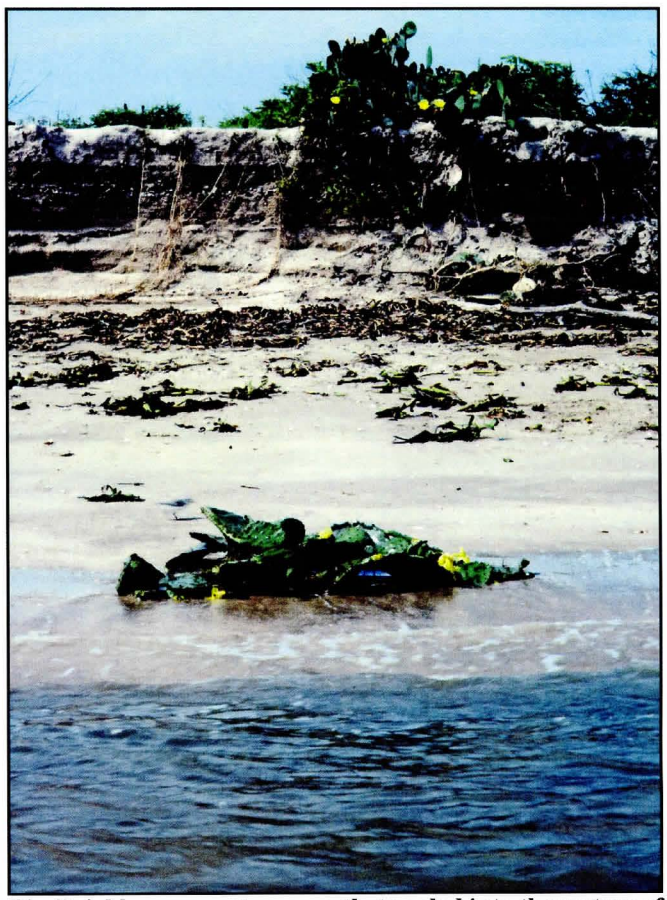
47. Trees on edge of rapidly eroding chenier. Note our ATV tracks in the sand. PHOTO: May 1991.

48. Hackberry Ridge. This highly eroded chenier is located east of Rutherford Beach but accessible only by foot, ATV or horse. Since 1991 the ridge has lost approximately 500-600 feet to the Gulf. Erosion is so rapid that hackberry trees and other types of vegetation tumble into the Gulf almost on a daily basis. To the east, erosion is even greater so that the state's Rockefeller Wildlife Refuge is now endangered. PHOTO: May 1991.

49. Hackberry trees recently toppled into the Gulf. PHOTO: May 1992.



50. Same as Fig. 49. PHOTO: May 1992.



51. Prickly pear cactus recently toppled into the waters of the Gulf — a seemingly odd but photogenic situation. PHOTO: May 1991.

than occasional cattle or deer. Therefore, I find it difficult to imagine how even a single pupa could have survived the floods, wind destruction, and later burnings. There is, however, a ray of hope. Such extirpation must have occurred at least once in the long past. And with the likelihood of a population in eastern Texas still viable, there is the distinct possibility that Texas emigrants will eventually move eastward to re-colonize appropriate venues on the cheniers. Only time will tell.

Butterflies in General

Most butterflies were extremely scarce. I observed the following: 2 giant swallowtails (*Papilio cresphontes*) at the Peveto Woods Sanctuary; 1 American lady (*Vanessa virginiensis*) near Grand Chenier; 6 Gulf fritillaries (*Agraulis vanillae*) at the Peveto Woods Sanctuary, 2 common buckeyes (*Junonia coenia*) at the East Jetty recreational facility and on Grand Chenier; 2 common checkered skippers (*Pyrgus communis*) in a pasture along Davis Road.

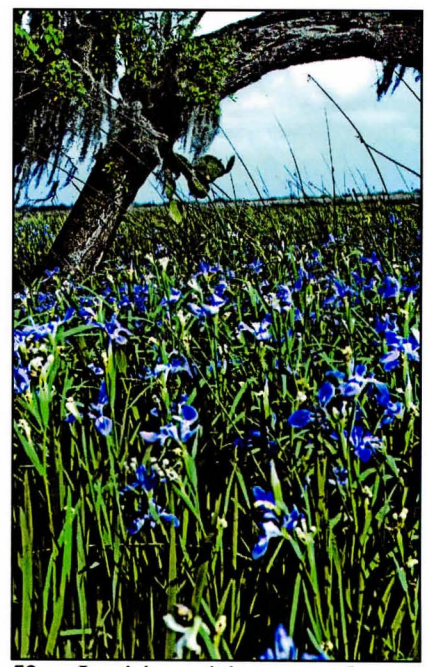
52. A male great southern white butterfly resting on its host, Virginia pepperweed (*Lepidium virginicum*). The butterfly was in the midst of a periodic population explosion during my visit in May 2016. PHOTO: Black Bayou Lake National Refuge, May 28, 2016. Courtesy of William Watson (DEAD CYPRESS PHOTOGRAPHY ©).

But there was a bonus: My visit correlated with a periodic mass emergence of great southern whites (*Ascia monuste*). Hundreds to thousands of these medium sized, snow-white butterflies were everywhere. Individuals were particularly abundant along Davis Road near the new East Jetty recreational area. Both males and females were abundant. However, very few showed any interest in feeding, odd since so many wildflowers were in bloom. Also, I failed to notice any mating or any females ovipositing. I presume the host for the region is Virginia peppergrass or pepperweed (*Lepidium virginicum*), a common low annual with small white flowers arranged in a panicle reminiscent of a bottlebrush. The plants were common near the salt marshes in the vicinity of the jetties.

Although the East Jetty area contained a considerable area of tidal flats with pioneer plants—previously noted excellent habitat for pygmy blue butterflies (*Brephidum*)—the water level during the time of my visit was exceptionally high, and so I was unable to walk about to search for the butterflies, which in the past, had been encountered on multiple occasions by me and other lepidopterists.

Louisiana Iris

Technically, five species are lumped within the term "Louisiana Iris," also referred to as "Louisiana Flag Iris" and endearingly referred to as "Louisiana's Fleur-de-Lis." *Iris giganticaerulea*, the largest of the species, is Louisiana's official state wildflower. Historically, these showy (large blue, but sometimes white and copper colored) were common bumble bee pollinated perennials throughout much of Louisiana's wetlands. But because of urbanization and salt-water intrusion, the iris domain has contracted to only two locales: Jean Lafitte National Historic Park (Barataria Preserve) and the chenier margins and marshes of Cameron Parish.



53. Louisiana irises on edge of marsh on Little Chenier. The live oak tree harbors a prickly pear cactus on its truck, probably a result of high water during a past hurricane. PHOTO: April 1991.

During my post-Hurricane Rita visits during the spring of 2006 I failed to locate any iris plants. In 2007, however, I did observe a dozen or so clumps. By 2016, the number of plants had increased significantly, particularly bordering ponds along Little Chenier road. Furthermore, a conversation with Phillip L. "Scooter" Trosclair, III, a biologist for the Rockefeller Wildlife Refuge, Grand Chenier, indicated that many blue irises along with white spider lilies (*Hymenocallis occidentalis*) punctuated the pastures on Grand Chenier during April. And so, I am relieved to conclude that Louisiana's official wildflower has once again survived the parish's periodic devastating storms.

Indigo

Indigo suffruticosa or West Indian Indigo should not to be confused with the common marsh shrub named rattlebox (*Daubentonia texana*). *I. suffruticosa* is a tropical species within the legume (pea) family. As such, plants cannot tolerate freezes, and so die back each year leaving behind viable roots for the following spring. Individual plants, which can attain a height of 5-6 feet, possess delicate feathery leaves, pale pink pea-like flowers in early summer, and small green/brown bean-like seedpods clustered banana style in autumn. Sap from the leaves and stems produce a persistent deep blue dye following a complicated receipt of fermentation, oxygenation, sedimentation, and drying. The dye was cherished as a coloring agent in historic times long before chemical dyes were synthesized. The tiny seeds housed in the small pods are favored by many birds, which upon defecating easily distribute the species—especially along fence lines. I was intimately familiar with *I. suffruticosa* because I had researched the dye and its use in Zapotec tapestry production in the 1980s in southern Mexico.

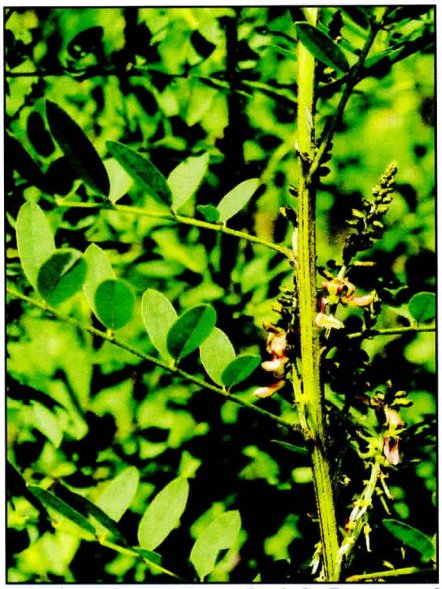
54. Clump of West Indian indigo west of Oak Grove near landfill pits and garbage dump. Foliage is not freeze tolerant, but root stocks are. The historic plant can be found at several locations on the Front Ridge on the elevated northern side of the highway (often along fence lines) between Grand Chenier and Cameron proper.

During my past summer/fall research on the cheniers, I noticed the indigo plants growing along fence rows on Grand Chenier and between Oak Grove and Cameron. (The species is documented to occur "on levees, in the marsh at Rockefeller Refuge, sandy cheniers of Grand Chenier to Cameron, Grand Isle, and in Natchitoches Parish" in *Wildflowers of Louisiana and Adjoining States* by C. Brown.) Indigo has a long history in Louisiana. Indigo production, in fact, preceded the mega crops of cotton and sugarcane as the state's first commercial export crop during the French colonial period (1682-1800), with peak exportation in the late 1700s. Although Cameron was not inhabited officially by white settlers until 1840, Native Americans and early Cajuns were present much earlier.

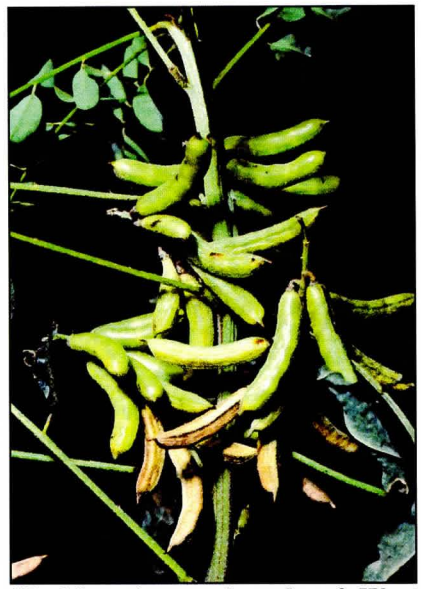
I have not read of any explanation as to how indigo has persisted in Cameron Parish for so many centuries. Perhaps indigo plants were originally carried to the cheniers by early Creole pioneers from other areas where indigo plantations flourished—Orleans, Point Coupee, and Natchitoches parishes, for examples. Cultivated in cottage gardens, the plants would have allowed early settlers to dye their bland handcrafted cotton fabrics. Conjecture, to be sure. Whatever, in spite of hundreds of years of abuse by hurricanes, saltwater intrusion, cattle grazing, marsh fires, and human settlement, West Indian indigo patently continues on the well drained shell-laden sandy soils along the southern edges of the cheniers above the marshlands.

55. Field with colonies of West Indian indigo (*Indigo suffruticosa*) on Grand Chenier 1-2 miles west of new school. The tropical plant was cultivated on plantations in French colonial Louisiana for its rich blue dye and as the state's first commercial/export crop. New spring growth is visible at base of dried stem stalks from previous year. Because fence lines/fields are periodically mowed or burned, indigo often grows in conjunction with spring wildflowers such as Texas tickseed and Indian blanket. The dye plant, which apparently is salt resistant, remains an important French legacy from the early eighteenth century.

But what about post Rita and Ike? Sure enough, during my 2016 revisit I found plants sprouting new growth and beginning to flower on point as in the 1990s. The plants thrive in conspicuous small colonies along the fence line on the ridge side of the highway traversing Grand Chenier. (Most of the plants were located about two miles east of the headquarters to the Rockefeller Wildlife Refuge.) Moreover, sizable stands occur near the small ponds created by landfill pits and the garbage dump several miles west of what was the Rutherford Motel in Oak Grove—specifically a mile or so west of the new Cameron High School complex. (The plants were



56. Small pea-shaped pink flowers of West Indian indigo.



57. Maturing seed pods of West Indian indigo. Pods are reminiscent of small clusters of bananas. Each pod contains dozens of small black seeds that are ready for harvest in late fall and that are readily eaten by many birds, especially doves. PHOTO: October 1991.

58. Old flyer (1990) advertising RUTHERFORD MOTEL. Motel was destroyed by Hurricane Rita.

easy to spot since they retained remnants of 3-4 foot dead stems from the previous year.)

I have not observed any butterflies nectaring on indigo; the species is bee pollinated. But because *I. suffruticosa* is in the pea family, indigo might host several skipper butterflies such as long-tailed skipper (*Urbanus proteus*) and the silver-spotted skipper (*Epargyreus clarus*).

ACKNOWLEDGEMENTS

Many people over the years have contributed information and assistance to my investigations in Cameron Parish, and I appreciate them all. However, I would like to express a special "thank you" to the following for assistance during my 2016 visit: Diane Borden Billiot (Visitor Services Manager, Southwest Louisiana National Wildlife Refuge Complex), Bell City; Jennings Clark (past manager of the Rutherford Motel, Oak Grove), Grand Chenier; Earnestine "Tina" Horn (Retired parish administrator—Cameron Parish Police Jury and ET Horn Consulting), Chenier Perdue, Creole; Craig M. Marks, Lafayette, LA; Dave Patton (Chairman, Sanctuary Committee, Baton Rouge Audubon Society's Peveto Woods Sanctuary), Baton Rouge; Kay Picou (Owner, The Ferry Landing, Bait Shop/Seafood Market), Cameron; Cyndi Sellers and Julie Fletcher (The Cameron Parish Pilot newspaper), DeQuincy); Phillip L. "Scooter" Trosclair, III (Biological Program Manager, Rockefeller Wildlife Refuge, Louisiana Department of Wildlife & Fisheries), Grand Chenier; William Watson (Dead Cypress Photography), Bastrop.

[PHOTOGRAPHS: All my images with noted dates were taken on 35 mm Kodachrome slide film with a CANON A-E 35 mm SLR camera on a tripod, and then digitized on a NIKON SUPER COOL SCAN 5000. Other images of mine were taken in 2016 with a PENTAX X70, 12 megapixel digital camera.]

REFERENCES

Brown, C.A., 1972. *Wildflowers of Louisiana and Adjoining States*. Louisiana State University Press. Baton Rouge, Louisiana. 247 pages.

Department of Conservation, Louisiana Geological Survey. 1935. *Geology of Cameron and Vermilion Parishes.* Geological Bulletin No. 6. 242 pages. New Orleans, Louisiana.

Dutton, B.E. and R.D. Thomas, 1991. The vascular flora of Cameron Parish, Louisiana. *Castanea*, March (Vol. 56, No. 1), pages 1-37.

Gauthreaux, S.A., 1971. A radar and direct visual study of passerine spring migration in southern Louisiana. *Auk*, Vol. 88(2): 343-365.

Gomez, G.M., 1998. *A Wetland Biography*. University of Texas Press. Austin, Texas. 270 pages.

Hanks, A.S., 1988. *Louisiana Paradise: The Chênières and Wetlands of Southwest Louisiana.* Center for Louisiana Studies, University of Southwestern Louisiana. Lafayette, Louisiana. 129 pages.

Holmes, J.D., 1967. Indigo in colonial Louisiana and the Floridas. *Louisiana History: The Journal of the Louisiana Historical Association*, Vol. 8(4):329-349. Baton Rouge, Louisiana.

Gandi, K.N. and D. Thomas, 1991. Additional notes on the Asteraceae of Louisiana. *Sida* 14(3):514-517.

North American Butterfly Association, 2001. *Checklist & English Names of North American Butterflies.* Second Edition. North American Butterfly Association, Morristown, New Jersey. 60 pages.

Pakenham, T., 2016. The natural explanation. IN: The Natural Moment: Evoking spirits. *Natural History* mag., May (Vol. 124:4), pages 2-4.

Ross, G.N., 1995. Butterfly wrangling in Louisiana: Cajun cowboys and caterpillars share a Gulf Coast habitat. *Natural History* magazine, May (Vol. 104:5), pages 36-43.

Ross, G.N., 1995. Indigo: the mystery of a Louisiana crop. *Louisiana Environmentalist* magazine, May-June (Vol. 3:3), pages 2-7.

Ross, G.N., 1995. The Louisiana irises. *Louisiana Conservationist* magazine, September-October (Vol. 47:5), pages 23-25.

Ross, G.N., 1996. The trans-Gulf migration. *Today.* Mineral Management Service (U.S. Department of the Interior). February (Vol. 6:1), pages 1, 11-13.

Ross, G.N., 1996. Orangetips die hard in Louisiana. *American Butterflies* magazine, Winter (Vol. 4:4), pages 4-10.

Ross, G.N., 1997. Indigo: Louisiana's living legacy. *Louisiana Conservationist* magazine, September-October (Vol. 49:5), pages 17-20.

Ross, G.N., 1998. Monarchs offshore in the Gulf of Mexico. *Holarctic Lepidoptera*, September (Vol. 5:2), page 52.

Ross, G.N., 2001. Monarch Section. *Louisiana Wildlife Federation* magazine, Nov./Dec. (Vol. 29:4), pages 13-39, front and back covers (inside and out).

Ross, G.N., 2006. Wild Iris: Louisiana's Fleur-de-lis. *Louisiana Wildlife Federation* magazine, spring(Vol. 34:1), pages 4-6, 25.

Ross, G.N., 2009. Louisiana's lost world. *Louisiana Wildlife Federation* magazine, Fall (Vol. 37:1), pages 14-20.

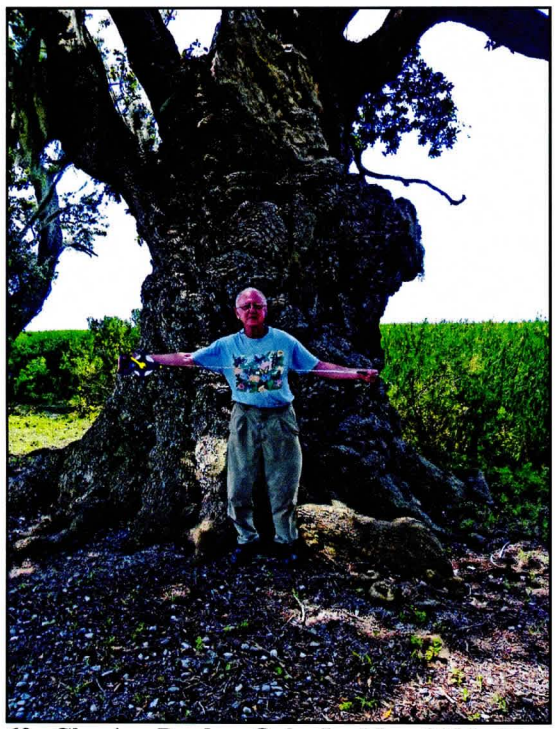
Ross, G.N., 2010. The monarch's trans-Gulf express: "A Clockwork Orange." *Southern Lepidopterists' News,* Spring (Vol. 32:1), pages 11-24.

Seiber, R.B., J.S. Seiber, A.D. Jones, H.J. Segall and L.P. Brower, 1987. Pyrroloizidine alkalods in overwintering monarch butterflies (*Danaus plexippus*) from Mexico. *Experentia* 43, Birkhäuser Verlag. CH-4010. Basel, Switzerland. Pages 943-946.

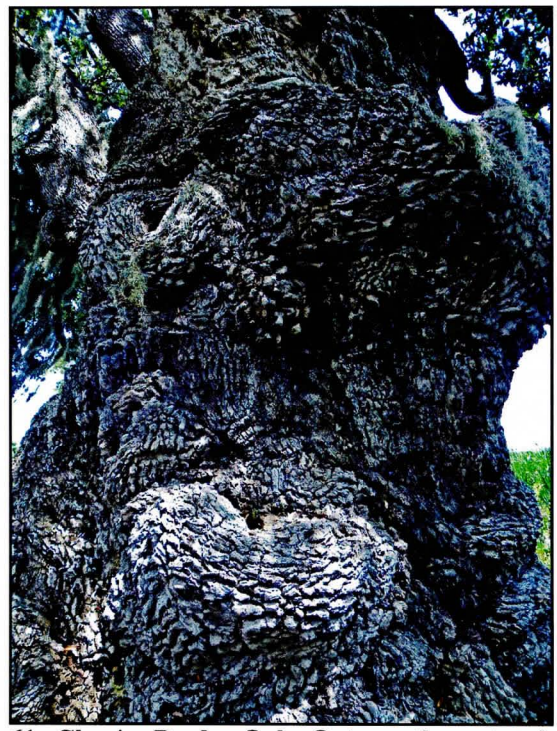
Sellers, C., 2011. The 800-year old Chenier Perdue Oak (photo). *The Cameron Parish Pilot* newspaper, January 27 (Vol. 54, No. 14), page 1.

Sellers, C., 2013. Thibodeaux hopes to restore coastal oaks. *The Cameron Parish Pilot* newspaper, October 31 (Vol. 56, No. 51), page 1.

59. Chenier Perdue Oak. On September 6, 2013, this specimen was recorded as entry #7235 in the roster of the live Oak Society of Louisiana Garden Club Federation. This storied specimen sports an official girth of 30 feet, 7 inches (trunk diameter is a little over 9.5 feet), and an estimated age of 800 years.



60. Chenier Perdue Oak. In May 2016, Mrs. Earnestine "Tina" Horn, a local resident, and I measured the girth to be 26 feet, 5 inches—slight discrepancy from the official measurement of 30 feet, 7 inches. PHOTO: Earnestine "Tina" Horn.



61. Chenier Perdue Oak. Outgrowths on trunk create difficulties in measuring.

Sellers, C., 2013. Volunteers gather at Grand Chenier to plant live oaks. *The Cameron Parish Pilot* newspaper, November 28 (Vol. 57, No. 3), page 1.

Strickland, G.T., 1972. Recent studies of Louisiana Rhopalocera. Unpublished manuscript presented orally by Lee Miller at Annual Meeting of The Lepidopterists' Society, San Antonio, TX. 20 pages.

Thomas, R.D. and C.M. Allen, 1996. *Atlas of the Vascular Flora of Louisiana.* Volume II: Dicotyledons: Acanthaceae-Euphorbiaceae. Louisiana Department of Wildlife & Fisheries, Natural Heritage Program. Baton Rouge, Louisiana. 213 pages.

Williams, E.H. and L. Brower, 2016. A conservation concern: how many Monarchs are there? *News of the Lepidopterists' Society* 58(2): 90-93.

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Photographs of Sunflowers from the Garden of Gary N. Ross (early summer)(Baton Rouge, LA).

ROAMING AROUND ROAN MOUNTAIN: HOTSPOTS, EYESPOTS AND EYE CANDY

BY

KATHY MALONE

Eager to explore, after we'd driven six hours through Tennessee one fine mid-summer's day, we hurried through hotel registration and hit the road to Roan Mountain. It was an hour away and dark clouds loomed, but we drove on, thinking afternoon storms would part.

"I see some blue sky over there," I remarked to my travel partner, Bart Jones, a butterfly enthusiast from Memphis and a past president of the Tennessee Native Plant Society. We found ourselves at the edge of a surreal meadow moments after we entered the park. Pinks, yellows, whites…a froth of flowers awaited. What butterflies would we find? Giddy with anticipation, we hopped out of the Jeep to don our hiking boots when suddenly the wind, not butterflies, swirled around us.

Then almost immediately after the gust we heard a serious roar. We got back into the Jeep and rushed out of the park to find downed trees and power lines, and blinking blue lights and road blocks. Winds of up to 70 mph had swept through the area not a mile from where we'd been. Whew! We'd have to try tomorrow.

Much to our relief and delight, improved weather greeted us the next couple of days. Bart's targets were lifer Meadow (Fig. 1) and Aphrodite (Fig. 2) fritillaries. I was hoping for a photo of a fresh Meadow Fritillary with my new camera, and any surprise treats.

We weren't disappointed. Up by the historic Miller Farmstead, a hotspot saturated with densely blooming Common Milkweed, we found our targets. Surprises included a pink and white striped larva of an Owlet Moth (Fig. 3), along with some 30 fresh Common Wood-Nymphs in forest-lined, lovely meadows on lazy hillsides that nestle the old farmhouse.

Fig. 1. Meadow Fritillary

We discovered that Meadow Fritillaries seem to prefer mowed grass for basking, and the meadows for nectaring. More discoveries awaited. When I reviewed my photos of the Common Wood-Nymphs I was surprised to see much variation in eyespot intensity and arrangement (Figs. 4-11). Also, these butterflies had yellow on their forewings like ones I'd seen in central Florida, and unlike the dark forms I'd seen in Indiana and Michigan.

The initial meadow we saw right before the storm nearly swallowed us our first afternoon was less productive with specialties. We waded through thick waves of Purple Coneflower, Fleabane and Black-eyed Susan seeking them. None found. But for "basic" species,

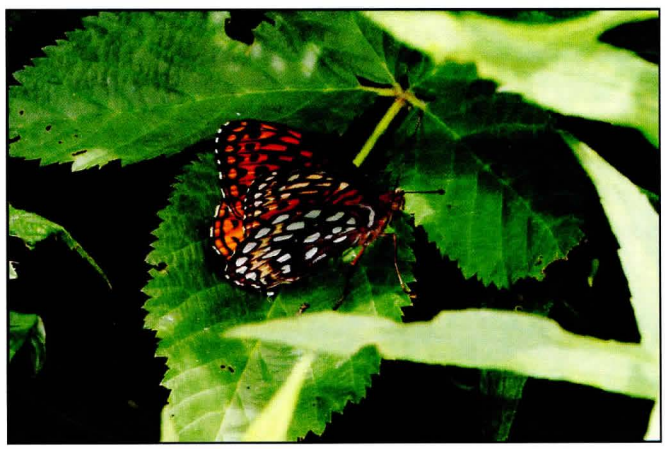

Fig. 2. Aphrodite Fritillary (Photo by Bart Jones)

Fig. 3. *Cucullia sp.*? (Owlet Moth larva)

such as Cloudless Sulphur, Pipevine Swallowtail, Great Spangled Fritillary, and Sachem and other skippers, this gorgeous lower-elevation meadow yielded a bounty. The higher-elevation meadow at Miller Farmstead furnished only one Great Spangled Fritillary.

Fig. 4. Central Florida, 2008, second and third eyespots on the hindwing are joined.

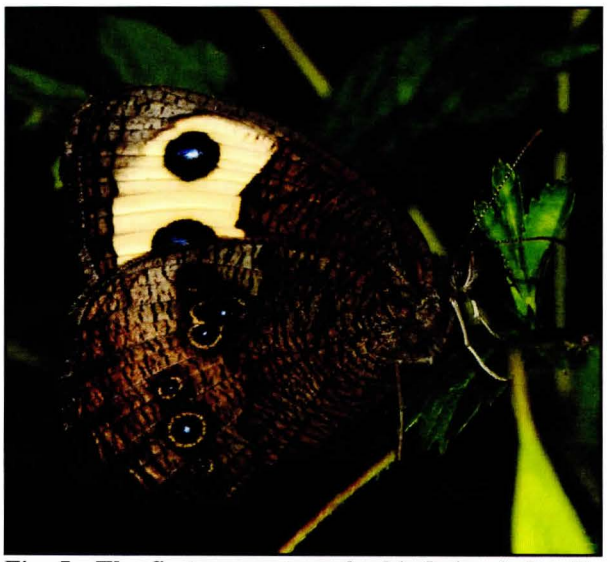

Fig. 5. The first eyespot on the hindwing is hardly visible. East Tennessee, 2016.

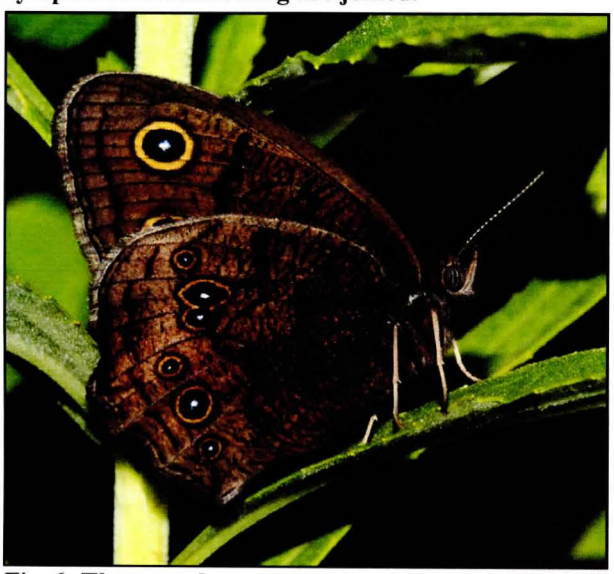

Fig. 6. The second eyespot on the hindwing is oval and joins with the third. Southeast Michigan, 2016.

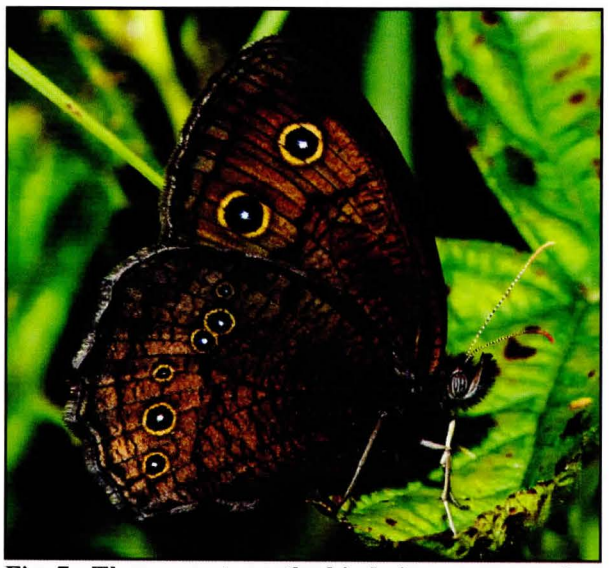

Fig. 7. The eyespots on the hindwing are somewhat uniform. Northeast Indiana, 2014.

Fig. 8. The hindwing eyespots are separate and somewhat uniform. East Tennessee, 2016.

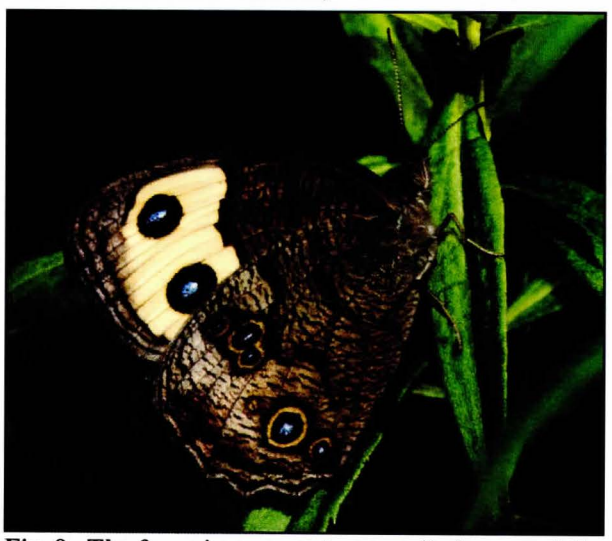

Fig. 9. The forewing eyespots are quite large and the fourth eyespot on the hindwing is almost non-existent. East Tennessee, 2016.

Fig. 10. The second eyespot on the hindwing is oval and connects to the one below. East Tennessee, 2016.

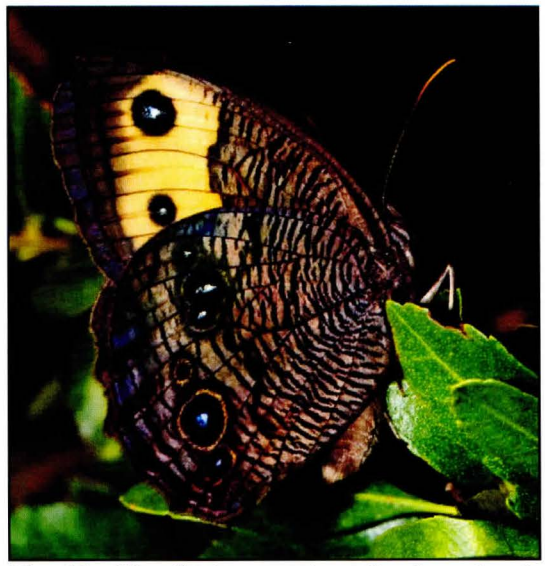

Fig. 11. The first eyespot on the forewing is larger than the second, the first three eyespots on the hindwing are soft, and the fifth eyespot on the hindwing is the largest of all the eyespots. Central Florida, 2009.

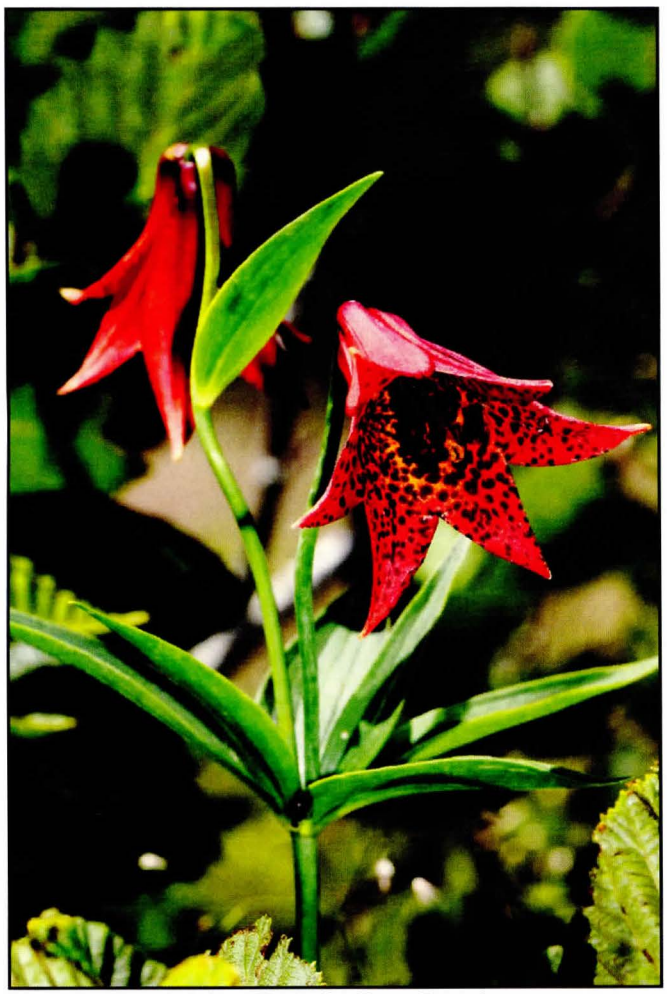

Fig. 12. Gray's Lily (Photo by Bart Jones)

One cannot "do" Roan Mountain without visiting the balds ecosystem at the tippy top. This is where Bart got his Holy Grail, at least as far as plants are concerned. It's worth mentioning in a Lepidoptera publication because it is so very beautiful, very rare and very threatened by some sort of evil fungus. It's Gray's Lily (Fig. 12). The red eye-candy jewel adorns the balds in a few patches at an elevation of about 6,000 feet. Bart hiked six miles round trip, with an elevation change of 1,100 feet, to photograph this treasure. There he also found fresh Aphrodite Fritillaries.

Whatever your thing, leps, plants, mountains, streams, prairies, forests…Roan Mountain is a stunning spot to enjoy, especially in agreeable weather.

[**Note:** All photos by Kathy Malone except Figs. 2 and 12 which were photographed by Bart Jones.]

(Kathy Malone, Spring Hill, TN; E-Mail: zlongwing@aol.com)

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MEXICAN FRITILLARY (*EUPTOIETA HEGESIA*) LIFE HISTORY

BY

BERRY NALL

Riverside in Salineño, Texas, is the best place I know of in Starr County to find Mexican Fritillaries. Cotton-leaf passionflower, *Passiflora foetida*, grows there in abundance, and it is the only potential host plant I have identified in that area. I've often watched the fritillaries fly around those passion vines, but I've yet to see a female depositing eggs.

Egg; shows development, 29-XI-2011

Day-old caterpillar, 2-XII-2011

In late November, 2011, I captured a female that clearly was carrying eggs. I placed her in a container with several pieces of the cotton-leaf passionflower, and waited expectantly. However, after three or four days she had not laid any eggs. Early on a Sunday afternoon, I also offered her Damiana (*Turnera diffusa*), a native host that I have in the yard. That evening I decided to release the butterfly. For some reason, I did not inspect the cuttings until Tuesday. When I did, I was pleased to discover that the female had left close to twenty eggs on the Damiana before she was released.

Caterpillar is turning orange, 4-XII-2011

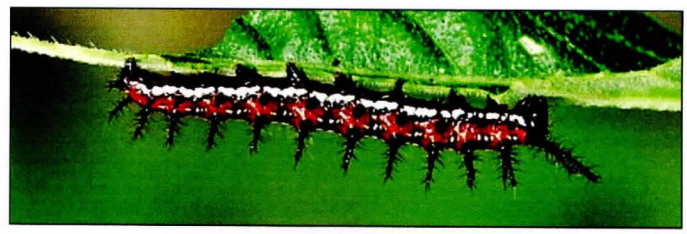
The caterpillars emerged on December 2, five days after the eggs were deposited. I decided to separate a single caterpillar to be the subject of this essay. I placed this one on a stem of Cuban Buttercup (*Turnera ulmifolia*), an ornamental relative of Damiana. This caterpillar grew much more quickly than the rest, pupating more than a week before any of the other caterpillars did.

Second instar, 9-XII-2011

Meanwhile, I had 18 more caterpillars and I was very curious: why did the female refuse to lay eggs on *Passiflora foetida*? Did she reject it because the species is always unsuitable as a host plant, or because these particular vines were unacceptable? (They were certainly not in good shape.) What other plants would Mexican Fritillary caterpillars eat? When the caterpillars had gained enough size for me to experiment, I offered a variety of passion vines that I had available. Natives *P. tenuiloba* and *P. suberosa* were rejected, as was an unidentified ornamental vine. But *P. foetida* was accepted. It is possible, therefore, that the fritillaries do use *foetida* when it is in good condition (or "in season").

Just entering third instar, 12-XII-2011

While I was investigating the host-plant issue, another question arose: why was the isolated caterpillar growing so much more quickly than the others? For 2-3 days it had been kept under slightly warmer temperatures, but that slight advantage didn't seem to explain the faster growth. On December 29 the study caterpillar had pupated, but the rest were nowhere near that stage. I wondered if food might have played a roll in development. I divided the remaining 18 caterpillars into three groups. One group was fed Damiana, one Cotton-leaf Passionflower, and one, Cuban Buttercup. The Cuban Buttercup group did seem to show slightly accelerated



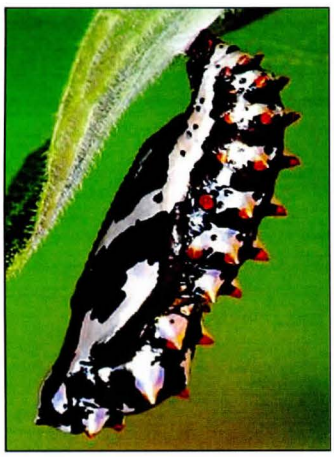
Fourth instar, 18-XII-2011

development, but results were inconclusive. It would be interesting to repeat this experiment with first-instar caterpillars.

Face of Mexican Fritillary caterpillar

When the Mexican Fritillary caterpillar is ready to pupate, it often makes a very loose tent by tying a few threads of silk to leaves or stems near where it will attach itself. The amazing beauty of the chrysalis is difficult to capture in a photograph. Where the camera records white patches, the eye beholds metallic reflections that make the chrysalis appear to be made of gold or silver.

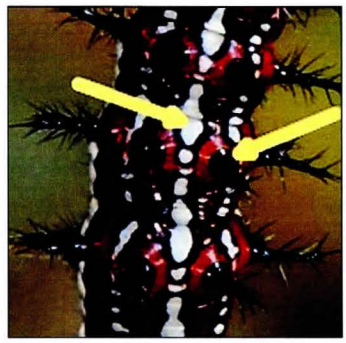
Caterpillars of the Mexican Fritillary and the Variegated Fritillary are very similar, and both may be found on the same host plants. The Mexican Fritillary larva can be identified by its more-or-less continuous black and white dorsal stripe. Also, the bases of the spines on each side of this stripe are surrounded by red. By contrast, the Variegated Fritillary has a red/orange dorsal stripe, possibly with some white spotting. The spine bases interrupt the subdorsal white stripe. These keys are identified in the pictures (to the right and top of page) that follow the fourth-instar.



Chrysalis, 28-XII-2011

Ready to emerge, 17-I-2012

Fresh adult Mexican Fritillary, dorsal, 18-I-2012



Mexican Fritillary (see text comments) **Variegated Fritillary**

Mature caterpillar is about 4 cm in the fifth (final) instar, 26-XII-2011

Preparing to pupate, 27-XII-2011

Fresh adult Mexican Fritillary, ventral, 18-I-2012

In 2008, I was able to photograph an adult just after it emerged from the chrysalis. Those pictures may be seen at http://leps.thenalls.net/content2.php?ef=Species/Heliconiinae/hegesia/emerge/hegesia_eclose.htm and are also reproduced in the following section entitled:

MEXICAN FRITILLARY (*EUPTOIETA HEGESIA*) EMERGENCE

It was a school day when this chrysalis was ready to eclose (emerge), so I took it to my high school classroom. We were fortunate that one of my classes got to see the butterfly just after it emerged. (We barely missed the main event; I suppose teaching got in the way of education!)

The butterfly was ready to go by early afternoon, but I kept it in a plastic container until I could release it when I got home at about 4:30. It did not batter itself or make any real effort to escape. Even when released, it rested quietly on the branch where I left it for quite some time before exercising its new-found gift of flight.

Notice that Mexican Fritillaries leave lots of silk around their pupae. In some of the later pictures, the silvery part of the chrysalis shows nicely.

6:27 a.m.

8:42 a.m.

Just after emerging, 11:11 a.m. on 3-IX-2008

11:13 a.m.

11:13 a.m.

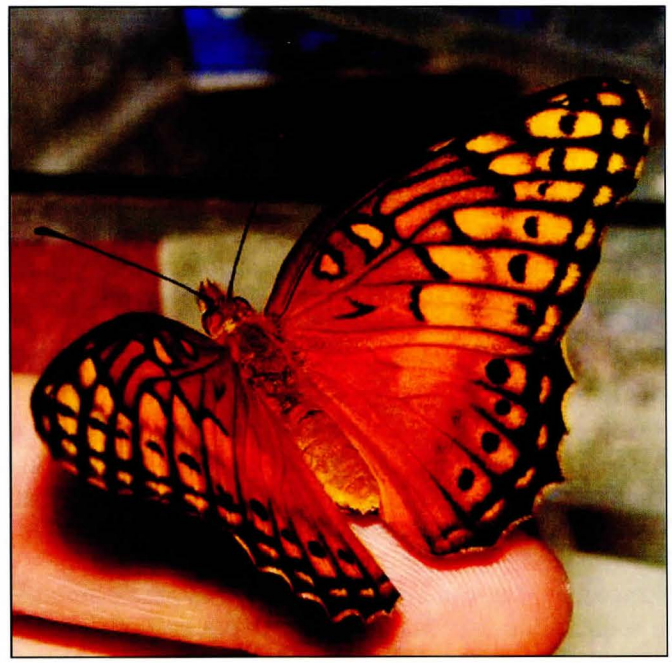
11:16 a.m.

11:16 a.m.

11:16 a.m.

11:17 a.m.

11:55 a.m.



Feeling energetic, 2:14 p.m.

The SL Society and the Editor thank Mr. Berry Nall for allowing us to reprint his life history of the Mexican Fritillary (*Euptoieta hegesia*) in the SLS NEWS. The original publication on the internet is listed as: http://leps.thenalls.net/content2.php?ref=Species/Heliconiinae/hegesia/life/hegesia_life.htm

Mr. Nall's website "*Berry's Butterfly Photos*" can be viewed at http://leps.the nalls.net/ His contact E-mail is lb@the nalls.net

[Note: caterpillars were all raised at Mr. Nall's home in Falcon Heights, Texas.]

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Typical terrain in West Texas (Dickens County, Texas), April 13, 2016
(~60 miles east of Lubbock, Texas)

NATURAL HISTORY NOTES ON UNDERWING MOTHS (*CATOCALA* SPP. AND *EUPARTHENOS NUBILIS*, EREBIDAE) OF THE CATSKILL MOUNTAINS, NEW YORK

BY

ROBERT DIRIG

THIS IS THE THIRD PAPER on large moths of the Catskill Mountains, New York. The first part described regional characteristics, habitats, research methods, and local life history details of saturniids, while the second presented similar facts about the sphinx moths (Dirig, 2015, 2016). This part features the Erebid **Underwing moths (genus *Catocala* and *Euparthenos nubilis*)**. It includes a review of GENE STRATTON-PORTER's charismatic early writings about Underwings, and summarizes detailed coaching by JOHN G. FRANCLEMONT on sugaring and daytime searching for resting adults.

These splendid ***Quadrifine Owlets*** (family Erebidae, subfamily Erebinae) are among the great prizes of summer moth hunting, due to their large size and bark-like forewings that conceal brightly colored hindwings (in many species) that are flashed to surprise would-be predators. Learning about saturniids and sphingids had been easy, using Frank E. Lutz's (1918) *Field Book of Insects*, with its helpful information and beautiful ink drawings and color plates. Another indispensable learner's reference was Robert T. Mitchell & Herbert S. Zim's (1964) Golden Nature Guide, *Butterflies and Moths*, which provided excellent short accounts and colored illustrations of many saturniid and sphinx species. But it was different with *Catocala*, where only a few examples of this large, richly diverse genus could be treated in popular guides.

GENE STRATTON-PORTER'S EARLY LITERATURE ON UNDERWINGS

My interest in Underwings was piqued in 1962, when I first read Gene Stratton-Porter's (1909) novel, *A Girl of the Limberlost* (Figs. 1-3). In this best-selling story, ELNORA COMSTOCK collects, raises, and deals in moths to finance her high school education in the Limberlost region of northeastern Indiana, later aided by her friend PHILIP AMMON. Stratton-Porter used moths and other natural history elements throughout this beautifully crafted, late Victorian/Edwardian-era tale. The Royal Walnut Moth (which she actually called "*Citheronia regalis*" in the novel), Cecropia (*Hyalophora cecropia*), Luna (*Actias luna*), Polyphemus (*Antheraea polyphemus*), and Promethea (*Callosamia promethea*) all make appearances; while the Yellow Emperor (*Eacles imperialis*) recurs as a mystical motif that almost becomes a character in the story. Stratton-Porter's unique, clever inclusion of authentic natural history subjects and events in her outdoor novels produced richly textured storylines that educated her millions of readers about nature in a subtle and entertaining way. She separately chronicled (and often illustrated) these natural history allusions in her nonfiction magazine articles and nature books. *Moths of the Limberlost* (Fig. 4), Stratton-Porter's most beautiful nature book, celebrated fourteen macro-moths of the famous Swamp, including a chapter on The Sweetheart (*Catocala amatrix*) and The Bride (*C. neogama*) (Fig. 5; Stratton-Porter, 1912b:226-240). But *A Girl of the Limberlost* was more important, as it catalyzed everything else she wrote about Lepidoptera, and catapulted Stratton-Porter (Fig. 6) to worldwide fame (Long, 1990:187).

***Catocala* have a subtle but important presence** in *A Girl of the Limberlost* — starting with an Underwing on the title page (Fig. 2). Elnora and Philip meet when she is hunting moths and he is fishing along Sleepy Snake Creek in the Limberlost. While he helps her remove an unusual, rusty-red Cecropia cocoon from a bridge plank (Chapter XIII, pp. 266-271[1]), she asks:

"*Have you ever hunted moths, Mr. Ammon?*"

"*Enough to know the ropes in taking them, and to distinguish the commonest ones. I go wild on* Catocalae. *There's too many of them, all too much alike for Philip, but I know all these fellows*" [saturniids]. Their conversation results in Philip arranging to come daily for six weeks to help Elnora collect Lepidoptera and other natural history material in the Swamp.

These intriguing moths become the focus in Chapter XVII (pp. 331-332), when Elnora tells her mother that Philip is "*coming in the morning, and we are going to put in a big day on* Catocalae."

"*Which is---*"

"*Those gray moths with wings that fold back like big flies, and they appear as if they had been carved from old wood. Then, when they fly, the lower wings flash out, and they are red and black, or gold and black, or pink and black, or dozens of bright, beautiful colours combined with black...*"

"*I remember,*" *said Mrs. Comstock.*[2] "*They are mighty pretty things. I've started up slews of them from the vines covering the logs, all my life.*"

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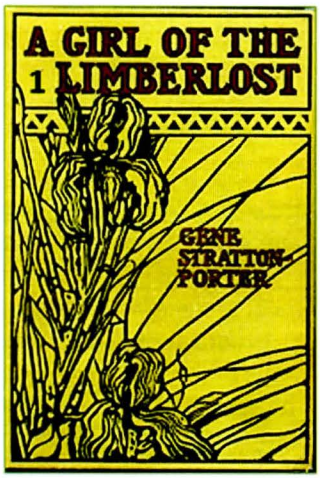
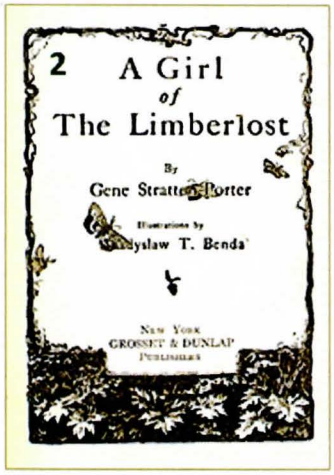
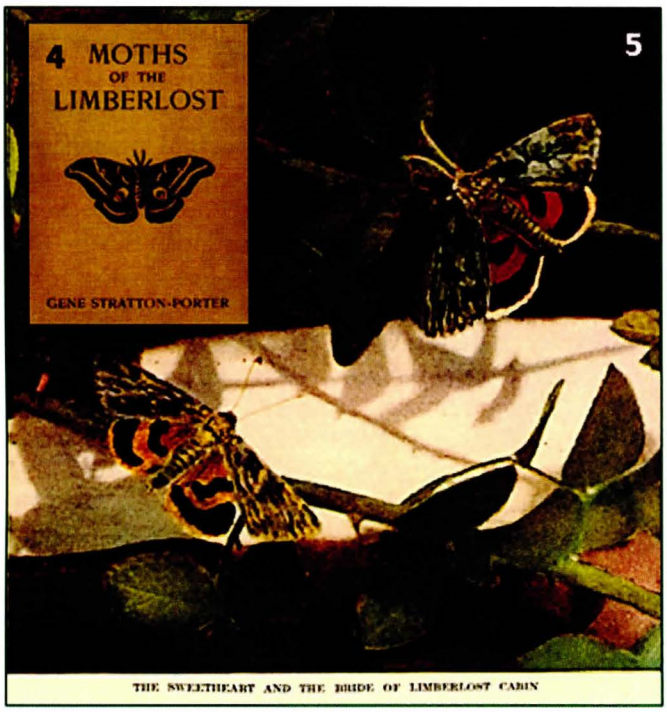
[1] **Pagination cited is from the first edition, published by Doubleday, Page & Co. in August, 1909. Numerous later editions and reprints (MacLean, 1976:22-27) may have slightly different pagination, but chapter references will help locate quoted passages therein.**

[2] **Kate (Katharine) Comstock is Elnora's mother.**





Gene Stratton-Porter at age 25 in 1888



THE SWEETHEART AND THE BRIDE OF LIMBERLOST CABIN

CATSKILL UNDERWINGS I: Gene Stratton-Porter's (Fig. 6) best-selling novel *A Girl of the Limberlost* was published in 1909 (Fig. 1), with an Underwing on the title page (Fig. 2). Chapter XVII features a sustained *Catocala* hunt by the heroine, Elnora Comstock, and her suitor, Philip Ammon (Fig. 3, *detail from the frontispiece by Wladyslaw T. Benda*) at the extensive LIMBERLOST SWAMP in northeastern Indiana. *Moths of the Limberlost* appeared in 1912 (Fig. 4). A detail from the frontispiece to Chapter Nine, p. 226 (Fig. 5), shows The Sweetheart (*Catocala amatrix, top*) and The Bride (*C. neogama*), which she photographed on Sweetbrier vines at Limberlost Cabin in Geneva, Indiana, then tinted with watercolors. Both books are classics in the American lepidopteral literature, and were charismatic influences on my interest in *Catocala* and other moths. Her 100-year-old Lepidoptera display survives at Limberlost Cabin (Fig. 7). R. R. Rowley (Fig. 8) was a mentor who read her draft of *Moths of the Limberlost*. Ximena McGlashan's *Butterfly Farmer* appeared as twelve monthly lessons in 1913-1914 (Fig. 9). A list of 1912 pupal prices is from Stratton-Porter's article in *Country Life in America* (Fig. 10). And a still from her 1924 silent film of *A Girl of the Limberlost* shows Gloria Grey as Elnora (Fig. 11).

LIST OF PRICES OF COCOONS AND PUPAE CASES 10

Cases	
Citheronia regalis	$.30 to $.50
Eacles imperialis	.20 to .25
Triptogon modesta	.12 to .20
Hyperchirio io.	.05 to .12
Protoparce celeus	.05 to .06
Protoparce carolina	.05 to .06
★Catocalae	.10 to .30

Please see image credits in the Acknowlegdements.

On page 333, the thread continues: "*Then they went ... to hunt* Catocalae. *It was a long and happy search.... It seemed as if every old gray tree-trunk, slab of loose bark, and prostrate log yielded the flashing gray treasures; while of all others they seemed to take alarm most easily, and be most difficult to capture.*

"*Ammon came to Elnora at dusk, daintily holding one by the body, its dark wings showing and its long slender legs trying to clasp his fingers and creep from his hold.*

"*Oh, for mercy's sake!*" cried Elnora, and stared at him.

"*I half believe it!*" exulted Ammon.

"*Did you ever see one?*"

"*Only in collections, and mighty seldom there.*"

"*Elnora studied the black wings intently. "I surely believe that's Sappho,*" she marveled. "*The Bird Woman will be overjoyed.*"[3]

And on page 337: "*Just look what I've brought!*" said Ammon, entering the arbor and greeting Mrs. Comstock. "*Borrowed it of the Bird Woman. And it isn't hers. A rare edition of* Catocalae *with coloured plates.*[4] *I told her the best I could, and she said to try for Sappho here....*"

After Philip returns to his law practice in Chicago, Elnora continues baiting for Underwings and sphinx moths during the rest of the summer (Chapter XVIII, p. 347).

There were no popular, illustrated guides to North American *Catocalae* in those days, except ***Holland***'s (1903) ***Moth Book***, which Stratton-Porter consulted for information on these moths. When I obtained a used copy of this classic in 1965, it was very exciting to study the color plates of Underwings, and read Holland's brief notes on each species. But Stratton-Porter (1912b:235) was deeply disappointed by the lack of detailed information in this book: "*I know less concerning* [Catocala] ... *than any other moths common with us, and all the scientific works .... afford little help. Professional lepidopterists dismiss them with a few words.... You can find at least a hundred* Catocala[5] *reproduced from museum specimens and their habitat given, in the Holland 'Moth Book,' but I fail to learn what I most desire to know: what these moths feed on; how late they live; how their eggs appear; where they are deposited; which is their caterpillar; what does it eat; and where and how does it pupate.... This will bear out my contention that scientific works are not the help they should be to the Nature Lover.*" ***Eliot & Soule*** (1902) did not include any *Catocala*, but ***Robertson-Miller*** (1912:110-118) offered details on rearing several species (both books were in Stratton-Porter's library, which is preserved at the Gene Stratton-Porter State Historic Site near Rome City, Indiana). ***Barnes & McDunnough***'s (1918a-b) beautifully illustrated monograph of the genus would not appear until six years after *Moths of the Limberlost* was published; while ***Draudt*** (*in* ***Seitz***, 1919) reviewed the American fauna, and included equally gorgeous illustrations. ***Forbes*** (1928, 1954) compiled further information on ranges, life histories, and larval foodplants, and ***Brower*** (1932) made an extraordinarily thorough contribution to our understanding of North American *Catocala* life histories and ecology. ***Sargent***'s (1976) comprehensive update on eastern North American Underwings was impressive for its blend of artistic presentation with the latest scientific information about these moths; and ***Covell*** (1984) pictured and briefly summarized information for many eastern species. Recent books (***Wagner***, 2005:356, 360-368; ***Wagner*** *et al.*, 2011:97-142, 185) have beautifully illustrated the larvae. And ***Gall & Hawks*** (2010) issued a new checklist with updated nomenclature for North American *Catocalae*. All of these works, published over the past century, have answered most of Stratton-Porter's questions. As with other large groups of moths, more discoveries remain to be made[6]. Current Underwing enthusiasts eagerly anticipate publication of the *Catocala* fascicle in the *Moths of North America* (MONA) series, which will synthesize more information on North American species than ever before.

Stratton-Porter's implied **Limberlost record of the Sappho Underwing** (*Catocala sappho* Strecker, Hodges number 8786) is interesting. Slotten (1992) found adult Sappho Underwings resting on tree trunks, 3-10 feet above the ground, in bottomland and habitats in Florida, so this whitish moth should have been visible during sustained daytime searches for resting Underwings in

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[3] The "Bird Woman" (as she was known in the Limberlost region, after many years of photographing wild birds and other nature subjects there) is Stratton-Porter's authorial presence in her books. In this novel, the Bird woman serves a a mentor for Elnora. See also Saxon (1915).

[4] I wondered if this might be ADALBERT SEITZ's volume VII, on North American Noctuidae, in his Macro-Lepidoptera of the World, but this appeared in 1919ff (see Draudt in Seitz, 1919), ten years after the novel was published. I doubt that she meant HOLLAND (1903), as his book was widely available, and certainly not rare. Perhaps it was STRECKER (1872), in which he described *Catocala sappho*, and characterized and illustrated that species and many others on color plates III, V, IX, & XI. [L. F. Gall (*email of 29 June 2016*) noted that this is "*unquestionably ... a reference to Strecker.*"]

[5] Holland (1903:260) wrote: "*Over one hundred species are attributed to our fauna. Of these, the majority are figured in our plates.*" He listed 72 species on pp. 260-268, and 78 specimens were illustrated (including *Euparthenos nubilis*) on Plates XXXI-XXXVI.

[6] D. F. Schweitzer (*email of 12 June 2016*) noted that "*Several southern species have been named or ... separated in the last 10-20 years, and others remain unnamed.*"

the Limberlost. Larvae of Sappho feed on hickories (genus *Carya*, section *Carya*), which occur widely in northern Indiana (Deam 1940:366-372). This moth was recently reported from Hocking Co. in south-central **Ohio** (Horn, 2014, *photo*), and earlier from Ohio by Draudt *in* Seitz, (1919:420); and is historically known from southern **Illinois**, **West Virginia**, and western **Pennsylvania** (Holland, 1903:260; Brower, 1932:74). Indiana records would not be surprising, and the Limberlost is only 70 miles north of the Ohio site. This vast wetland system was so rich, biologically, in its pristine state, that it might have held such a prize (Stratton-Porter, 1912b:3). Headwaters of the Wabash River near Geneva, Adams Co., Indiana — where Stratton-Porter lived at the time — drain west, then south along the Illinois border, to the Ohio River, providing a possible corridor for Sappho to colonize or stray to the Limberlost by moving upstream along its course.[7]

In 1991, I checked for *Catocala* in ***Stratton-Porter's Lepidoptera collection***, at the ***Limberlost State Historic Site in Geneva, Indiana***, where her badly faded and mostly unset and unlabeled pinned specimens are kept in the elegant, glass-fronted, black-velvet-lined wooden case that she used, set above a small fireplace in her bedroom (Fig. 7). There I found four disintegrating Underwing specimens, identified by Ernest M. Shull (on a list at the museum) as *Catocala palaeogama*, *C. habilis*, and *C. innubens*. A few specimens in the case were labeled "*Louisiana, MO, 1906*," in Stratton-Porter's hand. This locality (a small riverside town in Pike Co., on the Mississippi, ca. 70 miles northwest of St. Louis, Missouri) points to R. R. Rowley as the collector.

Professor Robert Rossell Rowley (1854-1935) was a renowned educator, highly accomplished paleontologist, and well known lepidopterist who focused on *Catocala* (Berry, 1931; Williams, 1936). He named *Phillipsia stratton-porteri*, a new Missouri trilobite he discovered, for the famous author (Rowley, 1908). She later asked him to review her manuscript of *Moths of the Limberlost* (Stratton-Porter, 1912b:30). I visited the ***Wilbur R. Enns Entomology Museum at the University of Missouri in Columbia, Missouri*** in June 1996, to examine Rowley's vast *Catocala* collection. I hoped to find a Limberlost Sappho, which I thought Stratton-Porter might have sent to him for verification, but saw none. Neither have I exhumed further mention of this rare moth in her extensive writings (MacLean, 1976). Stratton-Porter would not have mistaken "*this ermine of the Catocalae*," as Strecker (1872:95) called it, for any other black-winged species; and it would be very unusual for her to have mentioned a Limberlost occurrence without some basis in fact.[8] If she found Sappho in the Limberlost, it may have escaped, or the specimen was lost.

In 1996, I also visited the ***R. R. Rowley Annex of the Louisiana Middle School*** [formerly High School] ***in Louisiana, Missouri*** (where Rowley was a science instructor and Superintendent of Schools from 1894-1935), and viewed a large portrait of him, painted in oils by R. A. Chase in 1905 (Fig. 8). Unfortunately, Rowley's extensive correspondence files, which likely contained letters from Stratton-Porter, were long gone.

Throughout *A Girl of the Limberlost*, Stratton-Porter selected the moth that was most appropriate to the story's progress; so it was probably not by chance that she chose *Catocalae* as the first moths (after Cecropia) that PHILIP AMMON mentions, while unveiling personal information about himself (including his given name), during his initial conversation with Elnora (*see above*). A minor character named PETE CORSON, a shy local man, who has occasionally assisted Elnora and her mother in collecting cocoons and moths in the Limberlost, before Philip's arrival, lives mostly in the dark fastness of the Swamp; but, like an Underwing, at times he flushes in the daytime, or comes to lights at night, revealing bright flashes of a kind and helpful spirit. Both men are enamored of this beautiful young woman; Philip and she eventually marry.

In this story, Stratton-Porter advocated moth hunting as a compelling sport, rewarded by exciting new discoveries, occasional rare trophies, possible financial benefit, growing friendships, and even romance. Frank E. Lutz, in his *Field Book of Insects* (1918:154), sharply criticized her for "*encouraging the commercial viewpoint*"; but Ximena McGlashan's (1913-1914) *The Butterfly Farmer*, a remarkably detailed and helpful, year-long correspondence course for would-be butterfly farmers (Fig. 9), had already validated the possibilities of earning money by raising and selling Lepidoptera (Oppewall, 1979). At the end of her long article on Limberlost moths (Stratton-Porter, 1912a:64) in the June 15, 1912 issue of *Country Life in America* — Doubleday's sumptuous color magazine, which

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[7] **There is precedent for this wetland harboring other species of southern affinity: In ca. 1900-1901, the Limberlost was a then-rare northern outpost for a pair of Black Vultures (*Coragyps atratus*), when Stratton-Porter (1901, 1904, 1906, 1907:74-88) photographed their egg and nestling inside a huge hollow elm log. (Coincidentally, Hocking Co. is presently the northern limit of resident Black Vultures in Ohio; see *www.ohiobirds.org/obba2/pdfs/species/BlackVulture.pdf*). Brower (1932:29-32) discussed migrations and movements of Underwing moths, especially of hickory-feeders (which includes Sappho), beyond the northern edges of their range.**

[8] ***"[T]he experiences of which in my books I first live personally." (Stratton-Porter, 1919:118).***

previewed their August 1912 publication of *Moths of the Limberlost* — Stratton-Porter presented a table of current prices for moth pupae that were offered by dealers (Fig. 10). *Catocala* pupae were selling for 10¢ – 30¢ apiece in 1912!

MacLean's (1976) **comprehensive bibliography** (594 items) reveals the breadth of Stratton-Porter's literary output, which included at least thirty editions of *A Girl of the Limberlost*; among them were 50¢ reprints (Figs. 1-2) that made the book widely accessible (Long, 1990:187). In 1924, she also produced a **now-lost silent film** of the same title, based on this book, from which a few stills survive (Fig. 11). Stratton-Porter spoke about her film at its Los Angeles premiere. Managers of the theatre where it was shown reported that "*it has done the best business of any picture since they had control of the theatre*" (Meehan, 1928:289). In three illuminating essays, Stratton-Porter (1910, 1916a-b) thoroughly explained the logic and context for creating her **Nature Stories** (a unique form of fiction that she invented, which has not been fully understood [9]); while Jeannette Porter Meehan (1928) reviewed many details of her mother's extraordinary life and multiple careers.

The brief excerpts quoted above illustrate Stratton-Porter's skill in capturing the essence of Underwings, and hint at the ongoing, rich, Lepidoptera-infused atmosphere of this famous book. The nocturnal sugar and lights that Elnora and Philip set out to attract Underwings and sphingids, and their daytime baiting for butterflies, as part of their summer routine, likewise had a powerful allure for me, as an incipient lepidopterist, operating some 600 miles to the northeast, more than 50 years after the book was published!

SUGARING FOR MOTHS

Following this literary introduction to Underwings, I was eager to behold the living moths, and learn scientific facts about those in my Catskill territory. My first trophy was a pristine Pink Underwing (*Catocala concumbens*, Fig. 13), which was resting with closed wings in the daytime, on 16 Aug. 1963. Five days later, a Yellow-banded Underwing (*C. cerogama*, Fig. 18) flew to our porch light. These were all for 1963 — but enough to tantalize me. A few weeks after, I corresponded with three professional entomologists, seeking detailed information about Underwings and sugaring. Although I later learned that he rarely answered such inquiries, DR. JOHN G. FRANCLEMONT of the Department of Entomology at Cornell University sent a cordial and helpful response, initiating a mentorship that continued until his death at age 92 in 2004 (Hoebeke *et al.*, 2004).

In his letter to me of 30 Sept. 1963, Franclemont offered the first practical details I had about this time-honored nocturnal sport: "*The underwings generally come readily to bait; often on 'poor sugaring nights' they are the only moths which come to bait. The best baits that I have used are two. One consists of crushed very ripe bananas, brown sugar, dark molasses, and stale beer. (Open a can of beer and allow it to stand overnight; it will be necessary to keep it in a jar or bottle in the refrigerator to prevent spoiling between uses.) The mixture should be moderately thick. The second, I think it is ... better, consists of fermented peaches, molasses, and brown sugar. (Care must be taken that in fermenting the peaches do not sour; this means that an excess of sugar must be kept in them.) Either mixture may be put on trees and saplings with a paint brush.... Baiting is usually good along wood roads, along paths following streams, and along the edges of woodlands. Very dense stands of trees are usually poor. Special habitats such as bogs, marshes, and swamps have special species, but are often 'good' on relatively few nights during a season; they can often be included along with upland areas in a 'bait route.'*"

In the same letter, Franclemont recommended ***W. J. Holland***'s (1903) *Moth Book* as a helpful reference on northeastern moths. After obtaining a copy, I eagerly read Holland's (1903:146-150) atmospheric essay on "***Sugaring for Moths***," which resembles short stories by Washington Irving or Edgar Allan Poe in its excitement and dramatic literary style. In *A Girl of the Limberlost*, ***Stratton-Porter*** (1909) described Philip's method of *cooking* bait for butterflies and moths (Chapter XIV, pp. 286-287), its application and diurnal results (pp. 293-294), and the next morning's moth catch (Chapter XV, pp. 296-297, 303). I am unaware of *baits that stuck moths fast*, as Stratton-Porter described, but they may have existed in her era. ***McGlashan*** (1913-1914:91-96) gave detailed directions for using this collecting technique. ***Sargent*** (1976:80-91), in his chapter on "The Lure of Sugar," mentioned *cooking* moth bait; and ***Hedbor*** (2006) also *heated* his bait, using a little oatmeal for thickening. In 1966, I drew a cartoon about sugaring to use in teaching young entomologists about this collecting ritual (Dirig, 1966a:28, 1975:10; Fig. 15).

In September 1967, I began studies at Cornell, and finally met Franclemont. An affiliation with the Department of Entomology provided access to a world-class insect collection and entomological library, where I discovered Eliot & Soule's (1902) *Caterpillars and Their Moths*, Stratton-Porter's (1912b) *Moths of the Limberlost*, and McGlashan's (1913-1914) *The Butterfly Farmer*, among many other fascinating references.

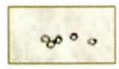
[9] **Stratton-Porter (1919:118) stated: *"I never had the nerve to call a book that I wrote a 'novel' or expected, or wished, that it should be judged on a fictional basis. I never have understood why my books should be put in the same category as the realistic novel, since they are as different as day from night in intention, execution, and results."***

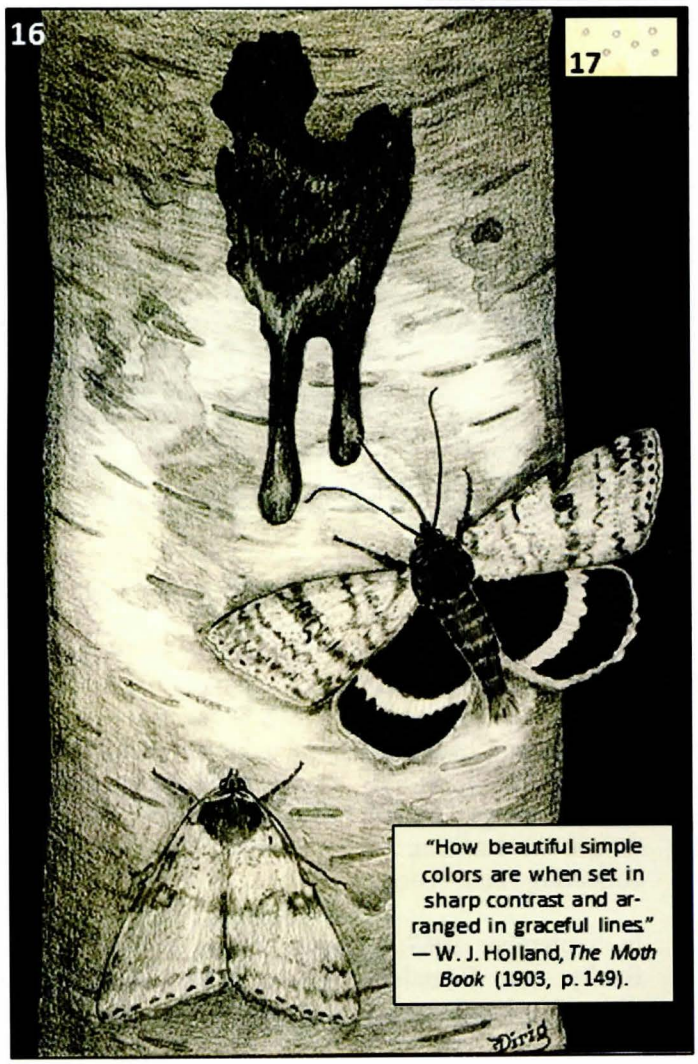
CATSKILL UNDERWINGS II

Pink Underwing

(*Catocala concumbens*)

Fig. 12. Pencil drawing (1974). Fig. 13. A quick colored sketch, when first found (16 Aug. 1963). Fig. 14. Drawing (ova as laid, Aug. 1965).





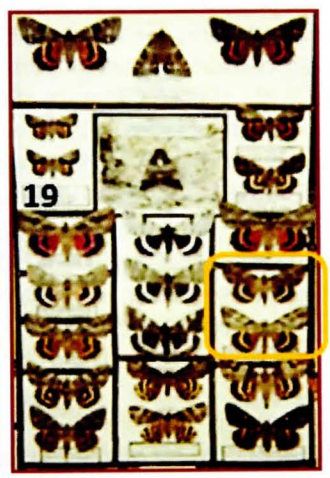
Sugaring for Moths

Fig. 15. A cartoon was used to teach young people about this time-honored collecting technique (Dirig, 1966a, 1975).

White Underwing

(*Catocala relicta*)

Fig. 16. This common Catskill species will come to bait (pencil drawing, 1974). Fig. 17. A drawing of the eggs (21 Aug. 1965); they seem small for such a large moth.



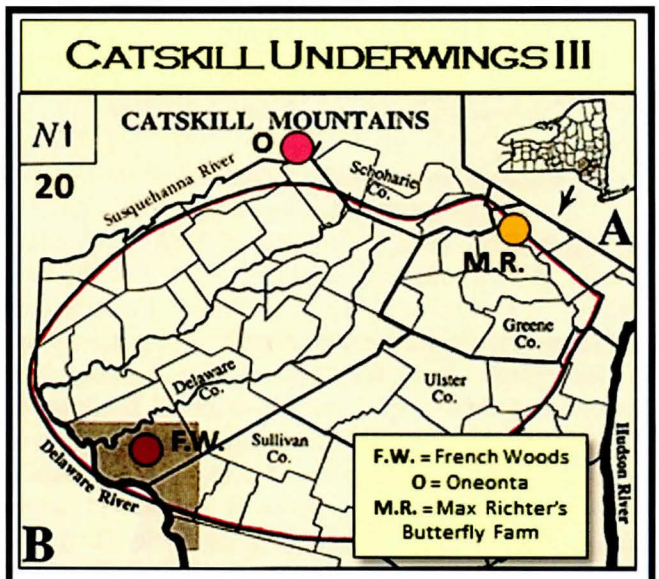
Yellow-banded Underwing

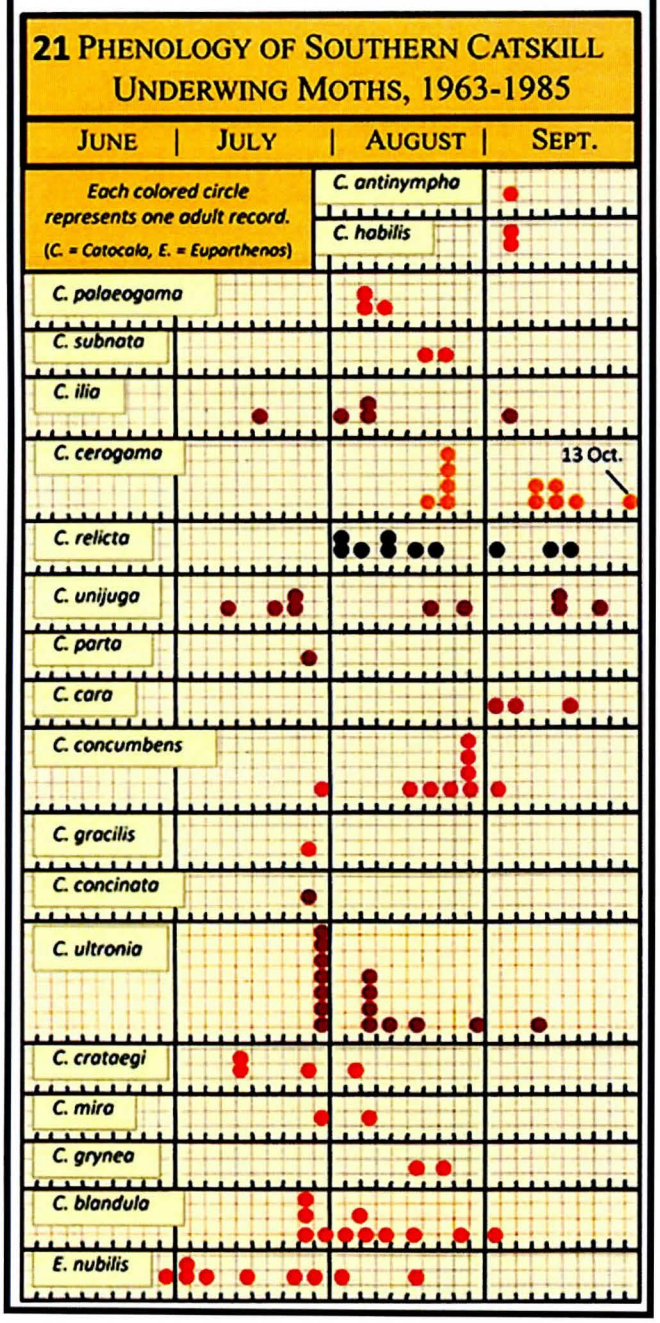
(*Catocala cerogama*, **f. "ruperti"** Franclemont)

Fig. 18. A quick (and not entirely accurate) colored sketch, when first found (21 Aug. 1963). Note the darker forewings, compared to the paler moth below (*yellow box, left*).

An Early *Catocala* Collection

Fig. 19. From a 4-H display, collected 1963-1966 at F.W.





After five years of struggling to find detailed information about moths in a rural setting, this huge university collection and library proved to be a treasure trove of information and inspiration.

Daytime Searching for *Catocala*

Franclemont's letter to me of 30 Sept. 1963 also included brief suggestions for finding resting Underwings in the daytime: "*The underwings, genus* Catocala, *tend to rest on tree trunks during the day. Often one can find* cara, concumbens, amatrix, parta, *and* unijuga *resting on the large willows and cottonwoods, their foodplants, as well as on other trees in stream bottoms; they can also be found around outbuildings and under bridges. The small species, which in general feed upon* Crataegus (*thorn apple*), *the heaths* (*blueberries*), *and the oaks are rarely encountered during the day in my experience, but they will come in great numbers to bait in the areas in which they occur.*"

Catskill Region and Methods

Collecting Site: The dark red line in Fig. 20-B surrounds the **Catskill Plateau**. My field work was centered at **French Woods** (**F.W.**, *red dot*). Max Richter's Butterfly Farm at East Durham, Greene Co., is indicated by **M.R.** (*yellow dot*). We are fortunate to have a historical annotated list of Underwings collected at Oneonta, Otsego Co. (**O**, *pink dot*), in the Susquehanna River valley, on the northern edge of the Catskills, in 1894 (Cleveland, 1896). C. Seeley (1963) provided a more recent window of information for a few species from Oneonta. See Dirig (2015, 2106) for further details of the F.W. collecting locus, including notes on the grounds, adjacent habitats, and available woody foodplants.

Collecting Methods: Underwing adults were primarily attracted by incandescent porch lights (Aug. 1963 to early Aug. 1965) and to UV (after 7 Aug. 1965), but occasionally were flushed or found resting in the daytime. From 7 July to early August 1970, a cylindrical marquisette ***butterfly trap*** hung 12-20 ft. up in a tree in the yard, near the UV light. This was framed at the top and bottom by circles of bent wire, with an inner cone-like opening above bait on a wooden base, which let insects in but not out. Female anglewings (*Polygonia* spp., Nymphalidae) were the target, but the bait likewise attracted myriads of flies and Hymenoptera during sunlit hours. Numbers of the *Catocala crataegi-mira-blandula* group also came at night, but they were so badly rubbed by morning that none could be saved as specimens. My ***bait recipe*** varied with the ingredients at hand: *Fermented fruits* (blackberries, pears, peaches or their peelings, mashed rotten apples, rotten plums); *stale beer* or other alcoholic beverages; blackstrap unsulphured *molasses*; a little *vanilla extract* and *brown*

sugar; and a small amount of *wheat flour* to thicken the mixture to the consistency of cake batter. Using the same recipe, I baited tree trunks near the house four or five times, with little success (one *C. unijuga*), before abandoning this technique as unproductive. Mead (1873), in his early notes on sugaring for moths in the Catskills, counseled persistence. Perhaps I stopped too soon? I did not search for Underwing larvae or adults resting in the daytime. See Dirig (1975, 2015) for further details of methods.

Specimen Identifications: I used Forbes' (1954:312-317) keys to adult *Catocalae*; images and text in Holland (1903), Barnes & McDunnough (1918a), Sargent (1976), & Covell (1984); and comparisons with Franclemont's specimens at the Cornell University Insect Collection, to identify my vouchers. JASON J. DOMBROSKIE kindly helped identify and confirm specimens of *C. crataegi, mira,* and *blandula.* **Scientific names** used herein follow Gall & Hawks (2010). **Hodges numbers** from Hodges *et al.* (1983) are given for each species.

Historical Catskill records: Cleveland (1896:74) listed twelve *Catocala* spp. and *Euparthenos nubilis* that he collected at Oneonta in 1894. His records and a few by Forbes (1928) and C. Seeley (1963:13, 15-16, 21) are referenced under Oneonta (**O**) in the species accounts below. [Forbes (1928) also added a few records from Greene and Sullivan Cos.] There appears to be no historical insect collection in Oneonta, and the whereabouts of Cleveland's collection is unknown. I listed nine Underwing species that were found at F.W. (Dirig, 1966b:10, usually without dates of capture), including *Catocala relicta, ultronia, unijuga, cerogama, ilia* (as *osculata*), *crataegi* (as *fratercula*), *concumbens, palaeogama,* and *Euparthenos nubilis* [also *C. piatrix*, in error], all identified using Holland's (1903) color plates.

These additional **abbreviations and symbols** are used in this article: **Co.** = County. **UV** = attracted to ultraviolet light. * = a non-native, naturalized plant. † = a cultivated plant. ♂ = male, ♀ = female. **elev.** = elevation above sea level. ***leg.*** (*legulus*) = the collector — the person who did the legwork! **Other collectors** included Andrea Barron, Kristin Barron, Bette J. Dirig O'Brien, & John M. Dirig at F.W., and C. Bunt & B. Bunt in Sullivan Co. My specimen repositories are the Cornell University Insect Collection (**CUIC**) for moths, and the Bailey Hortorium Herbarium at Cornell (**BH**) for botanical vouchers. General **foodplant** information in species accounts is from Sargent (1976), Covell (1984), & Wagner *et al.* (2011). **Plant names** follow the online *New York Flora Atlas*: *http://newyork.plantatlas.usf.edu/Browse.aspx?cat=Scientific+Name*]. Clock hours are in Eastern Daylight Savings Time.

SPECIES LIST

Underwing Moths
Subfamily Erebinae, Tribe Catocalini

***Catocala antinympha* (Hübner) 8775**
(Sweetfern Underwing)

RECORDS: F.W. (Fig. 21): **1969:** 5 Sept. (UV, only record). **O:** Common (Cleveland, 1896:74); Forbes (1928:631); C. Seeley (1963:15). **Notes:** These moths must range widely during their nightly flights, to end up so far from Sweetfern (*Comptonia peregrina,* Myricaceae), their very locally distributed **foodplant**. The **habitat** of this elegant, knee-high, scented shrub is south- and west-facing, sun-baked, stony, slanting banks near the Delaware River, where it spreads in large clumps. Known sites were 4-10 miles away (Doyle's Hill between Hancock and F.W., Lordville, and Bouchouxville, all Delaware Co.; and at The Basket, east of Long Eddy, Sullivan Co.).

***Catocala habilis* Grote 8778**
(Habilis Underwing)

RECORDS: F.W. (Fig. 21): **1969:** 5 Sept. (two, one bird-beaked). **O:** "*habilis*?," rare, Sept. (Cleveland 1896:74). **Larvae** are specialists on Shagbark Hickory (*Carya ovata*) [Gall, 1990(91):180; D. F. Schweitzer, *email of 12 June 2016*].

***Catocala palaeogama* (Guenée) 8795**
(Oldwife Underwing)

RECORDS: F.W. (UV, Fig. 21): **1966:** 8 Aug. (Dirig, 1966b:10). **1967:** 9 &10 Aug. **Larvae** on *Carya*, section *Carya* (D. F. Schweitzer, *email of 12 June 2016*).

***Catocala subnata* Grote 8797**
(Youthful Underwing)

RECORDS: F.W. (UV, Fig. 21): **1966:** 19 Aug. **1967:** 24 Aug. **Larvae** are specialists on Bitternut Hickory (*C. cordiformis*) [Gall, 1990(91):178; D. F. Schweitzer, *email of 12 June 2016*]. A grove of this tree grew within a few hundred feet of the yard. Wagner *et al.* (2011:122) characterized *subnata* as "*local and uncommon.*"

***Catocala ilia* (Cramer) 8801**
(Ilia Underwing; Beloved Underwing; The Wife)

RECORDS: F.W. (UV, Fig. 21): **1966**: 18 July (var. **conspicua** Worthington); Dirig (1966b:10). **1967**: 2 Aug., 8 Aug. (two), plus three other specimens (dates not recorded). **1969:** 5 Sept. (very worn, hindwing bird-beaked). **O:** Rare, Sept. (Cleveland, 1896:74); C. Seeley (1963:15). Their oak **foodplants** (*Quercus alba, rubra, & montana*) grew within 3-4 miles of our yard, at lower elevations, with Northern Red Oak (*Q. rubra*) closest to F.W. These moths may wander widely during their nocturnal flights (Brower, 1930, 1932:25-26).

***Catocala cerogama* Guenée 8802**
(Yellow-banded Underwing)

RECORDS: F.W. (Fig. 21): **1963:** 21 Aug. (Figs. 18-19), ♀, 10:00 p.m., porch light, forewings very dark, det. as **f. "ruperti"** by Franclemont (letter, 30 Sept. 1963; Sargent, 1976:26), which he named for Laurence R. Rupert, his friend and fellow lepidopterist (Dirig & Cryan, 1986). All of the following were at UV: **1965:** mid-Sept., three of four quite tattered. **1966:** four collected, no dates recorded (Dirig, 1966b:10). **1967:** 24 Aug. (four). **1972:** 11 Sept. (♀). **1974:** 13 Oct. (♀), settled on the house foundation, rubbed and torn, 7:30 a.m. (I never found another f. "**ruperti**" at F.W.) [**O:** Cleveland (1896:74) did not list this moth from Oneonta, and the Seeleys told me (*pers. comm.*, 1965-1966; M. Seeley, 1994) that they also had not seen it there.] **The foodplant,** American Basswood (*Tilia americana,* Tiliaceae), grew within sight of our F.W. house. **Behavior:** Adults rested near a light, rather than flying around it. If disturbed at night, they fluttered and zipped erratically before settling on a dark background, including clothing.

***Catocala relicta* Walker 8804**
(White Underwing)

RECORDS: F.W. (Fig. 21): **1964:** 16 Sept. (porch light, 10:00 p.m.). The following records were at UV: **1965:** 10 Aug. (11:00 p.m.), 18 Aug. (♀, *laid eggs, see below*), & 21 Aug. **1966**: three specimens, no dates recorded (Dirig, 1966b:10). **1967:** 2 Aug. (two), 5 Aug. (John M. Dirig, *leg.*). **1972:** 3 Sept. **1974:** 12 Aug., & 14 Sept. (6:30 a.m., 50°F., hidden in a fern clump near the light, with very heavy dew). **O:** rare (Cleveland, 1896:74); Forbes (1928:630); C. Seeley (1963:15). **Foodplants:** Salicaceae: Trembling Aspen (*Populus tremuloides*) grew in the yard, and Big-toothed Aspen (*P. grandidentata*) and shrubby willows (*Salix* spp.) within a few hundred feet. **Behavior:** This striking moth closely resembles pale tree bark when at rest, but flashes its startling black-and-white hindwings when disturbed (Fig. 16). **Life History:** On **18 Aug. 1965**, I caught a large ♀ with dark forewings at UV, and put her in a brown paper grocery bag. On **20 Aug.,** ca. 30 **ova** were glued inside the bag, mostly singly, sometimes two or three together (Fig. 17). Eggs were dark brownish-grey, round, and cemented flimsily, detaching with the slightest touch. Eggs were dented on **23-24 Aug**. They were put outside on **17 Sept.**, in natural conditions, but were transferred in **late autumn** to a refrigerator until **May 1966**, hatching on **3 June**. **Larvae** were fast-moving semi-loopers. On **11 June**, they were ½ in. (13 mm) long, green, and feeding on Trembling Aspen leaves, but died later in June.

***Catocala unijuga* Walker 8805**
(Once-married Underwing)

RECORDS: F.W. (UV, Fig. 21): **1966:** Eight specimens (known dates: 10, 19, & 24 July; Dirig, 1966b:10). **1967:** Very common, July & Aug., ca. fifteen specimens. **1968:** 23 Sept. (worn). **1972:** 20 Aug. **1974:** 14 Sept. (two, one with bird beak damage, 6:30 a.m.). **1977:** 24 July (at porch light). **1983:** 27 Aug. (*flying diurnally, tree-to-tree, before me, as I walked along a steep lane at the edge of a woodlot near a pond with willows*). Dorsal forewings varied from pale with distinct grey markings to quite dark. **Foodplants:** Poplar & willow. **Adult Feeding:** This common species was *the only one that came to sugar at F.W.* (one individual, mid-1960s).

***Catocala parta* (Guenée) 8806**
(Mother Underwing)

RECORDS: F.W. (Fig. 21): **1966:** 26 July (UV). **Larvae** feed on *Salix* and *Populus* spp.

***Catocala cara* Guenée 8832**
(Darling Underwing)

RECORDS: F. W. (Fig. 21): **1969:** 2 Sept. (UV). **Sullivan Co., Long Eddy**: **1972:** 16 Sept., Halsey Cemetery near the Delaware River, resting on a large dark gravestone in the daytime. **Delaware/Sullivan Co. line, Rock Valley Rd.: 1981:** 4 Sept. (Kristin Barron, *leg.*), along the North Branch of Basket Brook, 2½ mi. north of the Delaware River. **O:** "common, Sept." (Cleveland, 1896:74); C. Seeley (1963:15). **Foodplants:** Larvae prefer willows (*Salix* spp.; Gall, 1990[91]:181), especially Black Willow (*S. nigra*; D. F. Schweitzer, *email of 12 June 2016*), which grew along the river and its tributaries.

***Catocala concumbens* Walker 8833**
(Pink Underwing, Fig. 12)

RECORDS: F.W. (Fig. 21): **1963:** 16 Aug., resting on a vehicle in the middle of a large meadow, in the daytime (my first *Catocala*, Fig. 13). **1965:** Aug. (♀, laid eggs, *see below*). **1966:** two, dates not recorded (UV); Dirig (1966b:10). **1967:** 29 July, 27 Aug. (four, UV). **1969:** 20 Aug. (UV). **1973:** 23 Aug. (UV). **1976:** 2 Sept. (UV). **O:** common, Sept. (Cleveland, 1896:74); C. Seeley (1963:15). This and the previous species are the most beautiful local Underwings. **Foodplants:** Salicaceae. **Life History:** Twelve **eggs** were laid inside a brown paper bag in **Aug. 1965**: round, pill-like, brownish-grey, glued firmly to the substrate, deposited singly or in small patches (Fig. 14). They were refrigerated over the winter, hatched in **May 1966**, and the **larvae** fed on leaves of Trembling Aspen, but died in June.

***Catocala gracilis* W. H. Edwards 8847**
(Graceful Underwing)

RECORDS: F.W. (Fig. 21): **1976:** 27 July (UV). **Larvae** eat Highbush Blueberry (*Vaccinium corymbosum*) — which grew near the house — "*and a few other heaths*" (D. F. Schweitzer, *email of 12 June 2016*).

***Catocala coccinata* Grote 8851**
(Scarlet Underwing)
RECORDS: F.W. (UV, Fig. 21): **1967:** 27 July. **1968:** summer, date not recorded (Bette J. Dirig O'Brien, *leg.*). The **larvae** feed on oaks (*Quercus* spp.).

***Catocala ultronia* (Hübner) 8857**
(Ultronia, Dark Red, or Plum Tree Underwing)
RECORDS: F.W. (Fig. 21; forms and varieties *sensu* Forbes, 1954:334, and Sargent, 1976:66): **typical** form: **1964:** 28 July (at porch light, 10:30 p.m., muggy, 75°F). **1972**: 30 July & 9 Aug. (UV), 12 Sept. (UV, very rubbed). **Var. adriana** H. Edwards: **1966**: 31 July (UV); Dirig (1966b:10). **1967:** 29 Aug. (UV). **1975**: 9 Aug. (11:30 p.m., ripped and worn, UV). **Var. lucinda** Beutenmuller: **1967:** 7 Aug. (UV). **1974:** 9 & 12 Aug. (UV). **1975:** 17 Aug. (rubbed, UV). **1976:** 29 July (UV), 31 July (three, porch light & UV). **O:** quite common (Cleveland, 1896:74); C. Seeley (1963:15). **Foodplants** are Rosaceae. Black Cherry (*Prunus serotina*), Choke Cherry (*P. virginiana*), Fire Cherry (*P. pensylvanica*), *Sweet Cherry (*P. avium*), *†Apple (*Malus pumila*), shadbush (*Amelanchier* sp.), and numerous hawthorns or "thornapples" (*Crataegus punctata*, and several other species with oak-like leaves) grew at the edge of the yard, and in adjacent old fields. [D. F. Schweitzer (*email of 12 June 2016*) reported larvae possibly on apple and hawthorn; and on Beach Plum (*Prunus maritima*) on the Atlantic coast.]

***Catocala crataegi* Saunders 8858**
(Hawthorn Underwing)
RECORDS: F.W. (UV, Fig. 21): **1966:** 14 & 15 July (Dirig, 1966b:10, as *C. fratercula*). **1967:** 6 Aug. **1976:** 27 July. **Larvae** on hawthorns and *†Apple. [D. F. Schweitzer (*email of 12 June 2016*) noted, "*reportedly on apple.*"]

***Catocala mira* Grote 8863**
(Wonderful Underwing)
RECORDS: F.W. (UV, Fig. 21): **1974:** 31 July. **1985:** 7 Aug., in overgrown field near house (*flushed in the daytime*). **Larvae** on hawthorns.

***Catocala grynea* (Cramer) 8864**
(Woody Underwing)
RECORDS: F.W. (UV, Fig. 21): **1969:** 17 Aug. **1972:** 24 Aug. **Larvae** on *†Apple, hawthorns, & plum (*Prunus* spp.). [D. F. Schweitzer (*email of 12 June 2016*) added †crabapple (*Malus* spp.).]

***Catocala blandula* Hulst 8867**
(Charming Underwing)
RECORDS: F.W. (Fig. 21): **1967:** 7 Aug. (UV). **1969:** 4 Aug. (UV). **1970:** 1 Aug. (UV). **1974:** 5 Aug.; 17 Aug. (UV, fresh, 2:30 a.m., humid, 70°F, *det. by J. G. Franclemont, 1974, & B. C. Schmidt, 2016*). **1976:** 27 July (three, UV); 31 July (*det. by B. C. Schmidt*); 27 Aug. (bird-beaked) & 2 Sept. (both inside the house!). **Larvae** on *†Apple & hawthorns.

Subfamily Erebinae, Tribe Ophiusini

***Euparthenos nubilis* (Hübner) 8719**
(Locust Underwing, Clouded Locust Underwing)
RECORDS: F.W. (Fig. 21): **1964:** 28 June, 11:30 p.m., and **1965:** 15 July, 11:15 p.m., both at porch light. **1966:** June & July, five specimens, dates not recorded [Andrea Barron, *leg.*; Dirig (1966b:10)]. The following were at UV: **1967:** 24 July (♀). **1968:** 1 July. **1969:** 16 Aug. **1974:** 27 July. **Sullivan Co.: Fremont:** 1 July **1973** (♂); 5 July & 1 Aug. **1974** (♀♀) [C. Bunt & B. Bunt, *leg.*, in collection of Robert Hendrickson, Jr.]. **O:** (Cleveland, 1896:74, as "*Catocala nubilis*, rare, May"); C. Seeley (1963:15). In contrast to *Catocala* spp., this moth usually has two broods, and overwinters as a pupa (Wagner *et al.*, 2011:185). **Presumed Larval Foodplant**: A mature hedge of *†Black Locust (*Robinia pseudoacacia*) grew half a mile from our yard, where it has persisted on my father's family homestead since the first log cabins, in the 1850s. This tree is native from southwestern Pennsylvania to Georgia and Alabama, and in the Ozarks (Collingwood *et al.*, 1984:312-313), but has been in cultivation since the 1600s, and has spread widely throughout the Northeast via self-seeding and root-suckering. *I wonder if this moth has moved north, in tandem with its foodplant?* This tree can overtake open spaces, becoming a nuisance in preserves. It was recently classified as a Regulated Invasive Plant by the N.Y.S. Dept. of Environmental Conservation (DEC, 2014). **Behavior:** Catskill adults rested *near* a light, rather than flying around it. If disturbed, they fluttered and zipped erratically before landing on dark substrates (28 June 1964). I made a ***rare diurnal observation of an adult puddling*** in the shade of alders (*Alnus* sp.) edging a stream, at 11:00 a.m., in very hot (90°F.) and humid conditions. This moth rested flat on seepy sand, with its forewings covering the hindwings, probing for moisture and minerals, at the Albany Pine Bush, Albany Co., N.Y., on 1 June 1999. [Brower (1932:19) similarly noticed *Catocala cara* resting on water-soaked gravel in very hot conditions, in the Ozarks.]

DISCUSSION AND SUMMARY

About eighty species of *Catocala* occur east of the Mississippi River (Wagner *et al.*, 2011:97), with half of them potentially populating the Catskill region, according to range descriptions in Forbes (1954) and maps in Beadle & Leckie (2012). I found eighteen species (plus *E. nubilis*) in southern Delaware and Sullivan Cos., between 1963 and 1985 (Fig. 21). Forbes (1928:632) added ***Catocala clintonii* Grote 8872**, at Stony Clove, Greene Co., and ***C. micronympha* Guenée** (as "*C. fratercula*") **8876**, in Sullivan Co. At

Oneonta, Otsego Co., Cleveland (1896:74) additionally collected ***C. neogama* J. E. Smith 8798** ("common, Sept." — also listed by Forbes, 1928:631) and ***C. briseis* W. H. Edwards 8817** ("Quite common" — likewise mentioned by Forbes, 1928:631) in 1894.[10] [Forbes (1928:631) also generally recorded *C. briseis* from the "Catskills."] This totals **23 species known from the Catskills**. D. F. Schweitzer (*email of 12 June 2016*) suggested that at least a dozen more species that regularly occur in western New England, including seven with black hindwings, might live in oak-hickory woodlands on the N.Y. side of the Delaware River — which I never had an opportunity to sample with sugar or lights. C. Seeley (1963:15) showed two dark-winged species from Oneonta that are difficult to identify from her small photograph.

At F.W., *Catocala* spp. appeared between 10 July (*unijuga*) and 13 Oct. (*cerogama*), with most records in late July, Aug., and Sept.; while *Euparthenos nubilis* flew from 28 June to 16 Aug. (Fig. 21). The Underwing season began as saturniid and sphinx flights were starting to wane (compare phenologies in Dirig, 2015:140, 2016:47), extending the moth collecting season into late Sept.

The grounds at F.W. were located at 1840 ft. elev., on the crest of a wide, 6½-mile-long ridge, rising from 850 ft. elev. at the junction of Bouchoux Brook with the Delaware River on the south, to 2150 ft. elev., 2½ miles north of the house. Oak-, Shagbark Hickory-, and Sweetfern-feeding Underwings might have followed the deep Bouchoux Brook corridor (on the west side of the ridge) to reach my UV light at F.W. — or they may have followed the ridgeline itself. Brower (1930, 1932:25-26) conducted an early mark-release-recapture study of *Catocala* spp. in a timbered tract of hollows and ridges in the Ozark Mountains of southwestern Missouri. He reported recaptures made up to a mile away, and concluded that "*Catocalas shift about a great deal, many apparently leaving the vicinity*" — especially in reference to oak-feeding *C. ilia*.

Sugaring at F.W. attracted dozens of Copper Underwings (*Amphipyra pyramidoides* Guenée 9638, Erebidae, subfamily Amphipyrinae) to baited trees, but it was disappointing only to lure one *Catocala unijuga*. In contrast, JOHN F. CRYAN and I were delighted with our results, using a battery-powered UV light and sugar in an oak-hickory forest along the rim of the FALL CREEK GORGE near Ithaca, Tompkins Co., N.Y., where we caught *Catocala amatrix, cara, concumbens, residua, cerogama*, and *unijuga* on six nights between 13 Aug. and 11 Sept. 1974. We also had good success sugaring in open pine barrens at the KARNER PINE BUSH, Albany Co., N.Y., a legendary locality for Underwings (Bailey, 1877a-b), when *Catocala meskei, ultronia, ilia, antinympha, unijuga, relicta*, and *Euparthenos nubilis* came to our bait on 24-25 July 1979. THE BASKET (a large amphitheater at the confluence of Basket Brook with the Delaware River, east of Long Eddy, Sullivan Co.) might have been an **ideal Catskill site to try sugaring**, where lights would be highly visible, and baits would waft widely on evening breezes. Many Underwing foodplants — White, Northern Red, and Chestnut Oaks; blueberries; masses of Sweetfern; Shagbark Hickories; Trembling Aspens; and Black Locusts — grew on this dramatic bluestone outcrop and talus slope, with willow thickets and occasional Butternuts (*Juglans cinerea*) in or near the River valley. I wonder how spraying of DDT, Sevin, and *Bt* to control invading Gypsy Moths (*Lymantria dispar*) along the River, between 1959 and 1974 (Dirig, 2015:141), might have impacted spring-hatching Underwing larvae?

A CONCLUDING APPRECIATION

GENE STRATTON-PORTER (1863-1924) was a highly creative renaissance woman, who ***wrote in various styles*** (novels, short stories, nature books, a *Camera Notes* column in *Recreation* magazine, many other magazine articles, scholarly biblical encyclopedias, children's books, poetry, essays, and a skit for a woman who imitated bird songs); was a pioneer ***field naturalist and nature photographer*** (specializing in birds, Lepidoptera, wildflowers, and scenics, using glass negatives); a ***musician*** (playing piano, violin, and banjo, with a deep interest in bird songs); an ***artist*** (who hand-colored her photographs of birds and moths, designed magnificent gowns, and sketched the covers, front matter, and decorations for her books); an ***architect*** (who planned several remarkably original houses); a ***film producer*** (who adapted several of her novels in the silent era); an ***advocate for women's rights and wholesome values*** (through ideals instilled in her fiction, movies, and monthly essays in *McCall's*); an ***early conservationist*** (who promoted conservation of birds, moths, wildflowers, forests, and wetlands in her books and articles, and donated "Wildflower Woods," her Rome City haven for wild flora, to the State of Indiana as a preserve); and was ***deeply devoted to her family***. She was beloved by millions in her day, and remains popular. In this article, I pay homage to her inspiration

[10] **Three other names in Cleveland (1896) — *Catocala portia* Henry Edwards, now called *C. junctura* Walker 8829, "common, Sept.," which occurs west of the Catskill region; *Catocala desperata* Guenée, "rare, September (Sidney, [Delaware Co.,] N.Y.)," presently known as *C. vidua* (J. E. Smith) 8792, a black-winged species, which is possible; and "*Catocala puritanis*, rare, July," an epithet that does not appear in either Hodges *et al.* (1983) or Gall & Hawks (2010) — are impossible to resolve with current names, since they lack vouchers.**

and enduring influence in lepidoptery; but she also has had a wider impact through her varied careers and the breadth of her interests.

A Girl of the Limberlost was the masterpiece among her nature stories. Perhaps the greatest value of this novel and its accompanying nature book (*Moths of the Limberlost*), at present, is the window they provide into the *collecting philosophy and methods, and the passion for Lepidoptera that existed a century ago in this country.* Another important aspect of this story is its *brilliant, early model for teaching nature study in public schools.* Stratton-Porter elucidated this while describing Elnora's preparation for her new position as Lecturer on Natural History in the Onabasha Schools, following her graduation from high school (see Chapter XIV, pp. 281-283, 286; Chapter XVI, pp. 324-325; & Chapter XVII, p. 337). While it paralleled pioneering academic efforts in this field by acclaimed Cornell professors Liberty Hyde Bailey (1903) and Anna Botsford Comstock (1911), *A Girl of the Limberlost* reached a separate, largely non-academic audience. Stratton-Porter (quoted in Saxon, 1915:39-40) wrote: "*Perhaps the best justification of ... this book came ... when I received an application from ... President* [Theodore Roosevelt] *for permission to translate it into Arabic, as the first book to ... introduce our methods of nature study into the College of Cairo.*"

Stratton-Porter's list of unanswered questions about Underwings, in *Moths of the Limberlost* (page 235), essentially provided an outline for all later work on the genus. Both books were very influential in her lifetime, and still carry a nostalgic charm. Through her inclusion of Underwings in the novel, Stratton-Porter ultimately connected me with Franclemont — and at age fourteen, I was on my way to discover the variety and fascination of this large group of magnificent and mysterious moths.

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DR. F. REESE NEVIN, a medical entomologist at SUNY-Plattsburgh, via HOWARD ENSIGN EVANS, facilitated my initial contact with JOHN G. FRANCLEMONT in 1963. RODNEY DIRIG, J. FRANCIS DIRIG, & RUTH M. NEVIN helped acquire my copy of Holland's *Moth Book* in 1965. J. RICHARD HEITZMAN sent a photocopy of Berry's (1931) biography of R. R. Rowley, and JULIAN P. DONAHUE helped locate Rowley's Lepidoptera collection. LAWRENCE F. GALL shared distributional information on *Catocala sappho.* JEANNINE OPPEWALL & DAVID IFTNER also provided helpful information. HEATHER FURNES & ELAINE ENGST of the Cornell University Archives, Carl A. Kroch Library, helped me access Franclemont's correspondence. JASON J. DOMBROSKIE allowed me to confirm my F.W. *Catocala* identifications, using Franclemont's specimens at the Cornell University Insect Collection, and helped identify my small, hawthorn - feeding species. B. CHRISTIAN SCHMIDT (Agriculture and Agri-Food Canada, Ottawa) confirmed our determinations of *C. crataegi, mira, & blandula*, and identified two specimens of the latter. Special thanks to AKITO KAWAHARA for organizing Cornell's *Catocala* series during his undergraduate years. Access to the two Stratton-Porter Museums in Indiana was provided by REBECCA M. SMITH, MARLA FREEMAN, & BETTY DRINKUTT at Geneva, and MARGIE SWEENEY, MARTHA SWARTZLANDER, & MARY JEAN RIDER at Rome City. BRAD HUFTEY helped me photograph the portrait of Rowley at the R. R. Rowley Annex of the Louisiana Middle School in Louisiana, Missouri. WILFRED S. CRAIG, ROBERT W. SITES, & KRISTIN B. SIMPSON facilitated access to Rowley's Lepidoptera collection at the Wilbur R. Enns Entomology Museum at the University of Missouri in Columbia. ***Image credits:*** **Figs. 1-3** are from *A Girl of the Limberlost*; **Figs. 4-5** are from *Moths of the Limberlost*; **Fig. 6**, a photograph by G. J. Parrot, is from *The Lady of the Limberlost: The Life and Letters of Gene Stratton-Porter*, by Jeannette Porter Meehan, facing p. 116; **Fig. 7** is by the author, courtesy of the Limberlost State Memorial, Geneva, Indiana; **Fig. 8**, by the author, is courtesy of Brad Huftey; **Fig. 9** is a cover detail from a monthly instalment of *The Butterfly Farmer*; **Fig. 10** is from *Country Life in America*, 15 June 1912, p. 64; **Fig. 11** is from a later edition (1924*ff.*) of *A Girl of the Limberlost*; **Figs. 12-21** are by the author. TORBEN RUSSO helped with computer technology. ***Reviewers:*** LAWRENCE F. GALL, CAROLYN KLASS, DANIEL Z. RUBINOFF, and DALE F. SCHWEITZER provided helpful comments on a draft of this paper.

LITERATURE CITED

Bailey, J. S., 1877a. *Catocalae* Taken at Sugar at Center, N.Y. [now called Karner or Albany Pine Bush]. *Canadian Entomologist* 9:51-52.

Bailey, J. S., 1877b. Center, N. Y., Entomologically Considered. *Canadian Entomologist* 9:115-119.

Bailey, L. H., 1903. *The Nature-Study Idea, Being an Interpretation of the New School-Movement To Put the Child into Sympathy with Nature.* New York, Doubleday, Page & Co., [vii] + 159 pp.

Barnes, W., & J. McDunnough, 1918a. Illustrations of the North American Species of the Genus *Catocala. Memoirs of the American Museum of Natural History*, New Series, III(1):i-ii, 1-47, Plates I-XXII.

Barnes, W., & J. McDunnough, 1918b. Life Histories of the North American Species of the Genus *Catocala. Bulletin of the American Museum of Natural History* 38, Article V:147-177.

Beadle, D., & S. Leckie, 2012. *Peterson Field Guide to Moths of Northeastern North America.* Boston & New York, Houghton Mifflin Harcourt, xii + 611 pp. [some *Catocala* photos do not show the hindwings].

Berry, L. G., 1931, May. The Ideal Man [appreciation of R. R. Rowley]. *Ozark Life* 6(12):26-27.

Brower, A. E., 1930. An Experiment in Marking Moths and Finding Them Again (Lepid.: Noctuidae). *Entomological News* 41(1):10-15, Plate II (map), 41(2):44-46.

Brower, A. E., 1932. *A Study of the Bionomics of the Genus* Catocala *in North America (Lepid. Noctuidae), A Thesis Presented to the Faculty of the Graduate School of Cornell University for the Degree of Doctor of Philosophy.* [Ithaca, N.Y.], [v] + 142 pp., + Plates I-IV.

Cleveland, G. F., 1896. A List of Lepidoptera Taken at Oneonta, N.Y., 1894. *Entomological News* 7: 72-74 [*Catocala* on p. 74].

Collingwood, G. H., W. D. Brush, & D. Butcher, 1984. *Knowing Your Trees*, Washington, D.C., American Forestry Association, 389 pp.

Comstock, A. B., 1911. *A Handbook of Nature-Study for Teachers and Parents, Based on the Cornell Nature-Study Leaflets, with Much Additional Material and Many Illustrations.* Ithaca, N. Y., Comstock Publishing Co., xviii + 938 pp.

Covell, C. V., Jr., 1984. *A Field Guide to the Moths of Eastern North America*, Peterson Field Guide Series. Boston, Houghton Mifflin Co., xvi + 496 pp.

Deam, C. C., 1940. *Flora of Indiana.* Indianapolis, Dept. of Conservation, Division of Forestry, 1236 pp.

DEC, 2014, Sept. 10. *6 NYCRR Part 575 Prohibited and Regulated Invasive Species....* New York State Department of Environmental Conservation, http://www.dec.ny.gov/regulations/93848. html.

Dirig, R., 1966a. *Beginner's Guide to Collecting Insects.* Hancock, N.Y., 36 pp. [a privately printed 4-H manual, distributed by the author and at Max Richter's Butterfly Farm in East Durham, N.Y., 1960s-1970s.]

Dirig, R., 1966b. New York, pp. 9-10. ***In:*** Arnold, D. (ed.), *First Annual TIEG Season's Insect Collection Summary for the 1966 Season.* Teen International Entomology Group, Cornell University, Ithaca, New York, 12 pp.

Dirig, R., 1975. *Growing Moths.* N. Y. State College of Agriculture & Life Sciences, Cornell University, 4-H Members' Guide M-6-6, 39 pp.

Dirig, R., 2015. Natural History Notes on Giant Silkworms (Saturniidae) of the Catskill Mountains, New York. *Southern Lepidopterists' News* 37(3):132-143.

Dirig, R., 2016. Natural History Notes on Sphinx Moths (Sphingidae) of the Catskill Mountains, New York. *Southern Lepidopterists' News* 38(1):37-50.

Dirig, R., & J. F. Cryan, 1986. Obituary. Laurence Remington Rupert (1902-1978). *Journal of the Lepidopterists' Society* 40:242-245.

Draudt, M., 1919, 1. *Euparthenos* & 2. *Catocala*, pp. 417-431. ***In:*** Seitz, A., *Die Gross-Schmetterlinge de Erde, Eine systematische Bearbeitung der bis jetzt bekannten Gross-Schmetterlinge, In Verbindung mit namhaftesten Fachmännern herausgegeben* [Vol. VII (text).] Stuttgart — Verlag des Seitz'schen Werkes (Alfred Kernen). [*Catocala sappho* listed from Ohio on p. 420; Vol. VII illustrations separate.]

Eliot, I. M., & C. G. Soule, 1902. *Caterpillars and Their Moths.* New York, The Century Co., xiv + 302 pp. + 79 B&W plates.

Forbes, W. T. M., 1928. *Euparthenos & Catocala*, pp. 629-632. ***In:*** Leonard, M. D. (Ed.), A List of the Insects of New York, with a List of the Spiders and Certain Other Allied Groups. *Cornell University Agricultural Experiment Station Memoir* 101:1-1121+ localities map.

Forbes, W. T. M., 1954. Lepidoptera of New York and Neighboring States, Part III, Noctuidae. *Cornell University Agricultural Experiment Station Memoir* 329:312-339, 356.

Gall, L. F. 1990(91). Evolutionary Ecology of Sympatric *Catocala* Moths (Lepidoptera: Noctuidae). I. Experiments on Larval Foodplant Specificity. *Journal of Research on the Lepidoptera* 29(3):173-194.

Gall, L. F., & D. C. Hawks, 2010. Systematics of Moths in the Genus *Catocala* (Lepidoptera, Erebidae) IV. Nomenclatural Stabilization of the Nearctic Fauna, with a Revised Synonymic Check List. ***In:*** Schmidt, B. C., & J. D. Lafontaine (eds.), Contributions to the Systematics of New World Macro-moths II. *ZooKeys* 39:37-83; doi: 10.3897/zookeys.39.425.

Hedbor, J., 2006, Summer. Mothing with Bait. *VES* [Vermont Entomological Society] *News* 52:12.

Hoebeke, E. R., R. B. Root, & J. K. Liebherr, 2004. John George Franclemont, April 15, 1912 – May 26, 2004, pp. 12-15. ***In:*** *Memorial Statements, Cornell University Faculty, 2003-04.* Office of the Dean of Faculty, Ithaca, N.Y.

Hodges, R. W., T. Dominick, D. R. Davis, D. C. Ferguson, J. G. Franclemont, E. G. Munroe, & J. A. Powell (eds.), 1983. *Check List of the Lepidoptera of America North of Mexico, including Greenland.* London, E. W. Classey Ltd. & the Wedge Entomological Research Foundation, xxiv + 284 pp.

Holland, W. J., 1903. *The Moth Book, A Popular Guide to a Knowledge of the Moths of North America.* New York, Doubleday, Page & Co., xxii + 479 pp., 48 color plates. ["Sugaring for Moths" on pp. 146-150.]

Horn, D., 2014, Sept. A Tale of Two Moths [photo of living wild *Catocala sappho* in Ohio]. *The Ohio Lepidopterist* 36(3):5.

Long, J. R., 1990. *Gene Stratton-Porter, Novelist and Naturalist.* Indianapolis, Indiana, Indiana Historical Society, xviii + 286 pp.

Lutz, F. E., 1918. *Field Book of Insects, with Special Reference to Those of the Northeastern United States, Aiming To Answer Common Questions.* G. P. Putnam's Sons, New York & London, ix + 509 pp., + 24 color plates.

MacLean, D. G., 1976. *Gene Stratton-Porter: A Bibliography and Collector's Guide.* Decatur, Indiana, Americana Books, viii + 119 pp.

McGlashan, X., 1913-1914. *The Butterfly Farmer* 1(1-12):1-208.

Mead, T. L., 1873. Notes on Collecting [sugaring in the Catskill Mountains]. *Canadian Entomologist* 5:78-80.

Meehan, J. P. [GS-P's daughter], 1928. *The Lady of the Limberlost: The Life and Letters of Gene Stratton-Porter.* Garden City, N.Y., Doubleday, Doran & Co., Inc., xiv + 369 pp. + 6 photo-plates.

Mitchell, R.T., & H. S. Zim, 1964. *Butterflies and Moths, A Guide to the More Common American Species*, A Golden Nature Guide. New York, Golden Press, 160 pp.

Oppewall, J., 1979, Spring. From the Gold Rush to the Hollywood Rushes, Some Notes on the History of Butterfly Farming in California. *Terra, The Members Magazine of The Natural History Museum Alliance of Los Angeles County* 17(4):30-35.

Robertson-Miller, E., 1912. Chapter XVIII, "Sly and Secretive Underwings, The Catocalas, *Catocalae*," pp. 110-118. ***In:*** her *Butterfly and Moth Book, Personal Studies and Observations of the More Familiar Species*. N.Y., Charles Scribner's Sons, xx + 249 pp.

Rowley, R. R., 1908. *The Geology of Pike County*. Missouri Bureau of Geology and Mines, Vol. VIII, Series 2:94-95, Plate XIX, Figs. 28-[29] (latter labeled "23" in error).

Sargent, T. D., 1976. *Legion of Night: The Underwing Moths*. Amherst, University of Massachusetts Press, ix + 222 pp.

Saxon, E. F. [signed "S. F. E"], 1915. *Gene Stratton-Porter, A Little Story of the Life and Work and Ideals of "The Bird Woman."* Garden City, N.Y., The Country Life Press, Doubleday, Page & Co., [ii] + 52 pp. + frontispiece (portrait).

Seeley, C., 1963. *Moths of the Woodside*. Village Printer, Laurens, N.Y., 40 pp.

Seeley, M., 1994. Part 4, "The Children," pp. 78-93. ***In:*** *For the Love of Dolls and Roses, A Story of the Author, Her Life, Her Successes and Failures.* Livonia, Michigan, Scott Publications, viii + 182 pp.

Slotten, J. R., 1992. Life History Notes on *Catocala sappho* and *Catocala ulalume* (Noctuidae). *Journal of the Lepidopterists' Society* 46(2):161-163.

Stratton-Porter, G., 1901, Dec. A Study of the Black Vulture. *Outing* 39(3):279-283.

Stratton-Porter, G, 1904. *Freckles.* New York, Doubleday, Page & Co., xii + 433 pp.

Stratton-Porter, G., 1906, Aug. What I Have Done with Birds. V — The Black Vulture. *Ladies' Home Journal* 23(9):19.

(Robert Dirig, Plant Pathology Herbarium, Cornell University, Ithaca, NY 14853; E-mail: red2@cornell.edu)

Stratton-Porter, G., 1907. *What I Have Done with Birds: Character Studies of Native American Birds Which, Through Friendly Advances, I Induced To Pose for Me, or Succeeded in Photographing by Good Fortune, with the Story of My Experiences in Obtaining Their Pictures.* Indianapolis, Bobbs-Merrill Co., [xx] + 258. *Obtaining Their Pictures* Indianapolis, Bobbs-Merrill Co., [xx] + 258.

Stratton-Porter, G., 1909. *A Girl of the Limberlost.* New York, Doubleday, Page & Co., xiv + 485 pp., 4 color plates.

Stratton-Porter, G., 1910, Feb. Why I Wrote "*A Girl of the Limberlost.*" *World's Work* 19(4):12545-12547.

Stratton-Porter, G., 1912a, June 15. Hidden Treasure: The Winged Jewels That Nature Brings Forth on Soft June Nights for Our Brief Admiration — An Intimate Study of the Moths of Limberlost Swamp. *Country Life in America* 22(4):cover I, 17-18, 29-36, 60, 62, 64, cover III.

Stratton-Porter, G., 1912b. *Moths of the Limberlost, with Water Color and Photographic Illustrations from Life.* Garden City, N.Y., Doubleday, Page & Co., xiv + 371 pp.

Stratton-Porter, G., 1916a, Feb. My Work and My Critics. *The Bookman* (London) #293, vol. XLIX:145-146 (Anon. introduction), 146-155, 157, 159, 162, 164-165.

Stratton-Porter, G., 1916b, Sept. My Life and My Books. *Ladies' Home Journal* 33(9):13, 80-81.

Stratton-Porter, G., 1919, Aug. Why I Always Wear My Rose-colored Glasses. *American Magazine* 88:36-37, 112, 114, 117-118, 121.

Strecker, H., 1872. *Lepidoptera, Rhopaloceres and Heteroceres, Indigenous and Exotic; with Descriptions and Colored Illustrations*. Reading, Pa., Owen's Steam Book and Job Printing Office, 143 pp., plates I-XII [*Catocalae* on plates III, V, IX, XI, and discussed in those monthly parts].

Wagner, D. L., 2005. *Caterpillars of Eastern North America, A Guide to Identification and Natural History.* Princeton and Oxford, Princeton University Press, 512 pp.

Wagner, D. L., D. F. Schweitzer, J. B. Sullivan, & R. C. Reardon, 2011. *Owlet Caterpillars of Eastern North America.* Princeton and Oxford, Princeton University Press, 576 pp.

Williams, J., 1936. Robert Rossell Rowley. *Journal of Paleontology* 10(3):228.

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Photographs taken by Gary N. Ross of Sunflowers in his Garden in Baton Rouge. Louisiana (early summer).

PANOPODA REPANDA WALKER (LEPIDOPTERA: EREBIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

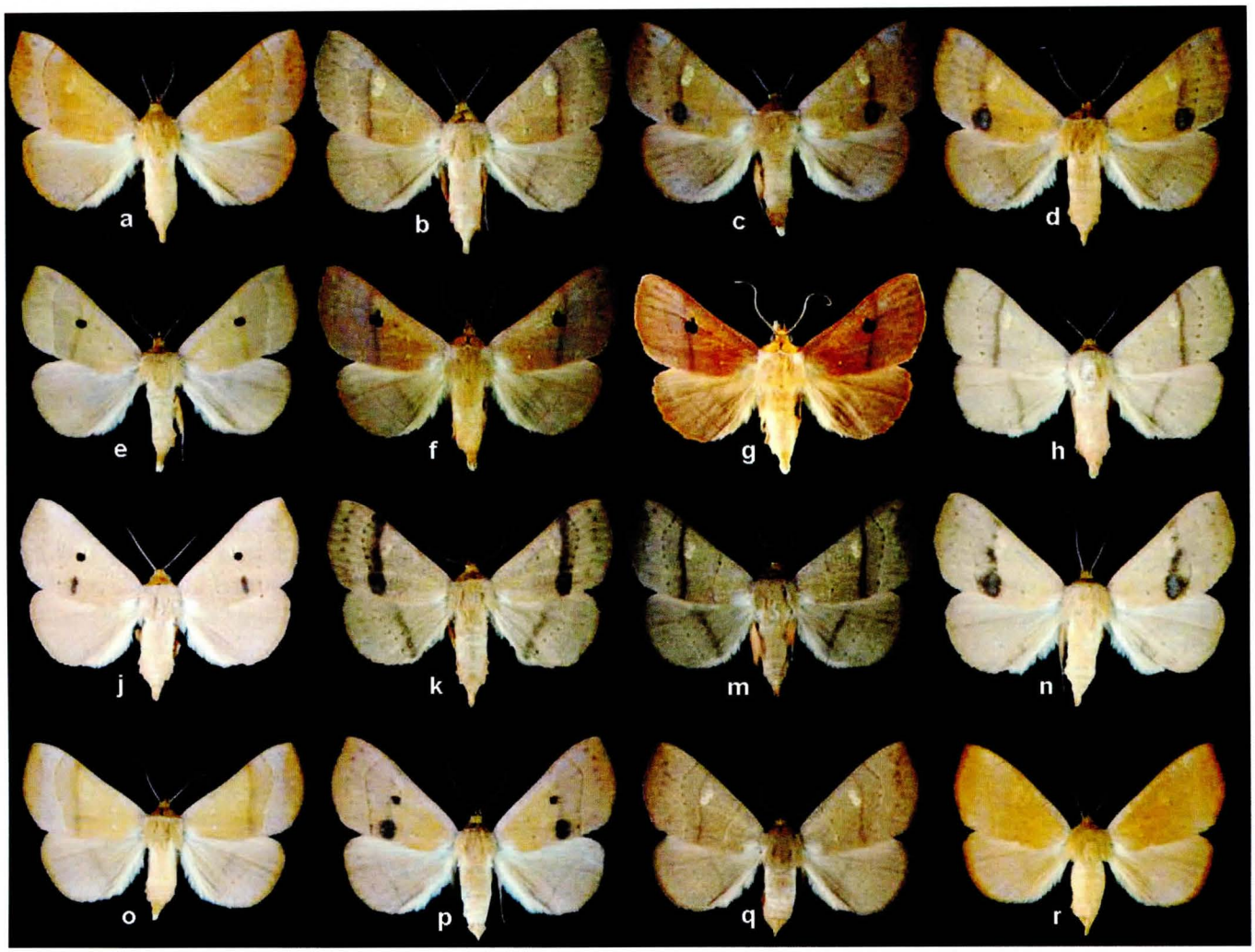

Fig. 1. ***Panopoda repanda*** phenotye variations at the *Abita entomological study site: male and females.

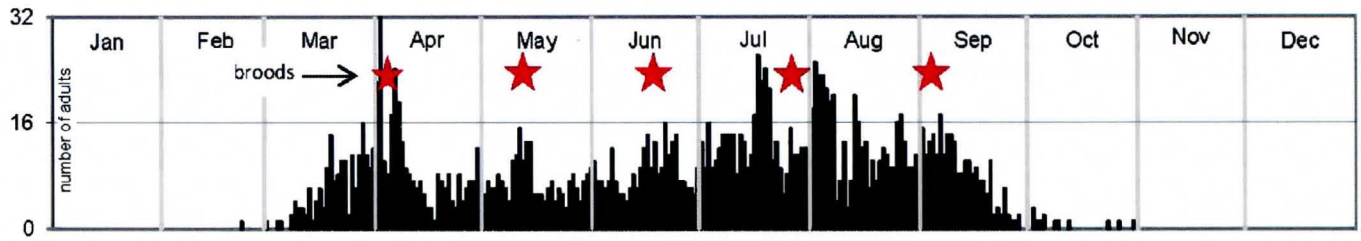

Fig. 2. Adult ***P. repanda*** captured in Louisiana. n = 1,992

The highly variable in appearance and medium-size moth ***Panopoda repanda*** Walker (Fig. 1) occurs quite commonly within the state of Louisiana. Previously, I reported upon another member of this genus, ***Panopoda rufimargo*** Hübner (Brou, 2012). On some phenotypes of ***repanda***, the upper forewings may appear as varying shades of nearly immaculate orange, tan, or brown color, with at most a barely discernible post median line, and/or reniform spot. The color of the reniform spot can be jet black, to whitish, or even barely distinguishable from the ground color.

Regarding other characteristics of the upper forewings and hindwings, numerous specimens have a dark line or band emanating from the inner margin of the forewing proceeding to the coastal margin distally of the post median line, though in some individuals, it may intersect the reneform spot. Below the reneform spot, and much closer to the inner margin, there can be a substantial subreniform spot, though in some individuals it is completely absent. The

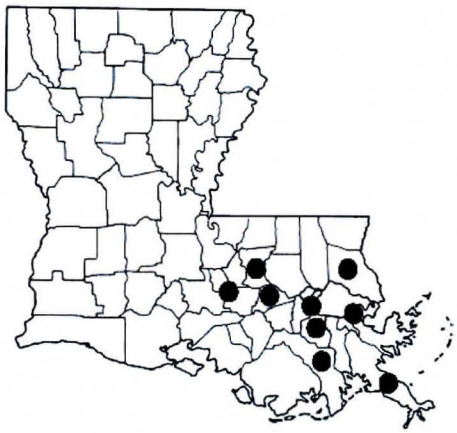

Fig. 3. Parish records for ***P. repanda***.

postmedial lines on the forewings often appear as a line of small dots occurring at veins. These dots can be black or a combination of contrasting black and white, the white component usually on the distal edge. Distally and adjacent to the postmedian line there can be a line or wide band of gray or blue-gray dusting of scales. When present, the antemedian line also appears as a less populated line of small dots either black or white or combinations of these colors, though the white component in this case, usually is basad of the black portion. The median line more often occurs as a wider broad line of dark scales occurring on the hindwing, and usually absent on the forewings, or on some individuals, at best is barely distinguishable.

Within Louisiana, adults of ***repanda*** have been captured continuously from the beginning of March through the end of October (Fig. 2). This species appears to have five annual broods, the initial brood peaking early April, and four subsequent broods peaking at approximate 38-day intervals, mid-May, mid-June, late July and early September, as noted by red markers in composite multi-year phenogram (Fig. 2).

I have records for adult ***repanda*** in Louisiana only from seven southeast Parishes (Fig. 3), though this is no doubt indicative of my own shortcomings regarding documentation of records. Chapin and Callahan (1967) previously listed ***repanda*** for the area around Baton Rouge, Louisiana, from April to September.

Covell (1984) pictured ***repanda*** and listed its range from North Carolina to Florida, west to Kentucky and Texas, and occurring April to June and August, and all months in Florida. Heppner (2003) stated ***repanda*** occurs from North Carolina to Florida, west to Missouri and Texas and flies January to November. Rockburne and Lafontaine (1976) listed Canadian records for ***P. rufimargo*** and ***P. carneicosta***, but not for ***repanda***. Powell and Opler (2009) did not cover ***repanda***.

*Abita entomological study site: sec.24,T6S, Range 12 East, 4.2 miles northeast of Abita Springs, St. Tammany Parish, Louisiana.

Literature Cited

Brou Jr., Vernon A., 2012. Panopoda rufimargo Hübner (Lepidoptera: Erebidae) in Louisiana. *South. Lepid. News* 34: 154-155.

Chapin, J.B. and **P.S. Callahan,** 1967. A list of the Noctuidae (Lepidoptera, Insecta) collected in the vicinity of Baton Rouge, Louisiana. *Proc. La. Acad. Sci.* 30: 39-48.

Covell, Jr., C.V., 1984. *A Field Guide to Moths of Eastern North America.* The Peterson Field Guide Series No. 30. Houghton Mifflin Co., Boston. xv + 496pp., 64 plates.

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.

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

Rockburne, E.W. and **J.D. Lafontaine,** 1976. *The cutworm moths of Ontario and Quebec.* Can. Dept. Agr. Pub. 1593.

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Photographs of dwarf Zinnias from the Garden of Gary N. Ross (Baton Rouge, Louisiana).

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DIAPHANIA HYALINATA (LINNAEUS) (LEPIDOPTERA: CRAMBIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

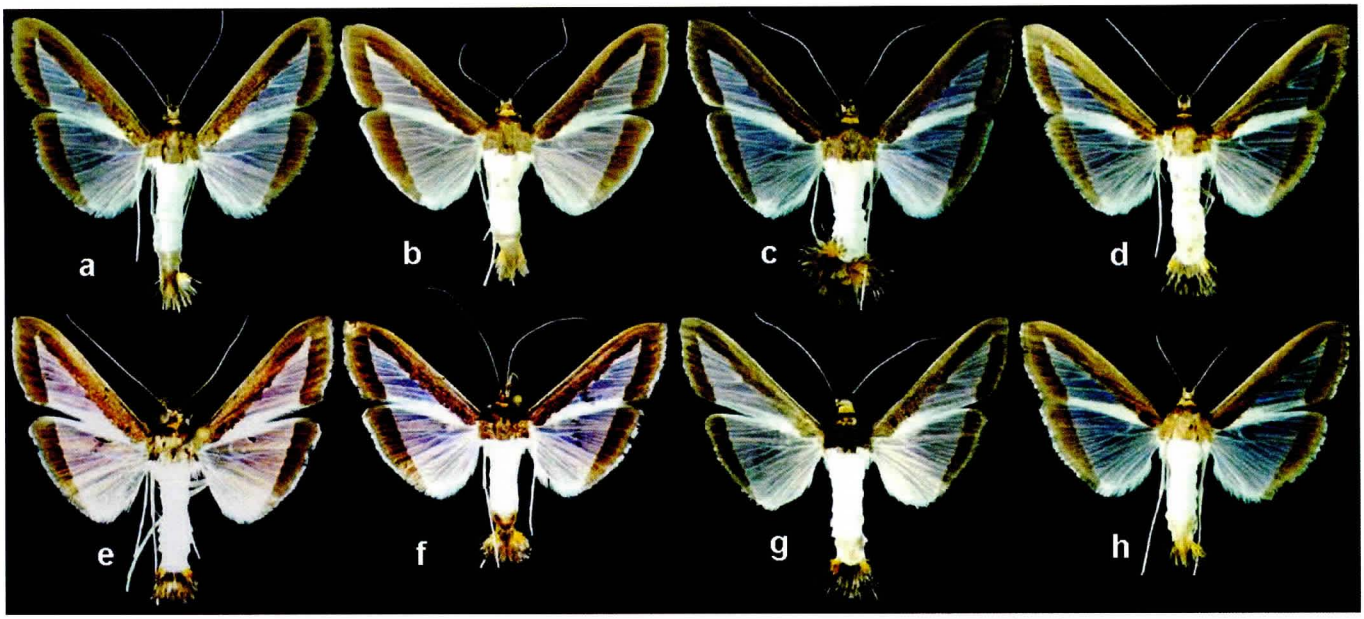

Fig. 1. ***Diaphania hyalinata*** (Linnaeus) phenotypes: a-h. males and females.

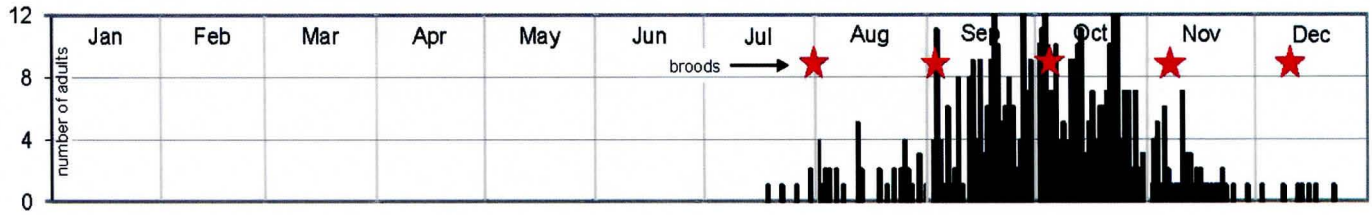

Fig. 2. Adult ***D. hyalinata*** captured at sec.24T6SR12E, 4.2 mi. NE of Abita Springs, Louisiana. n = 496

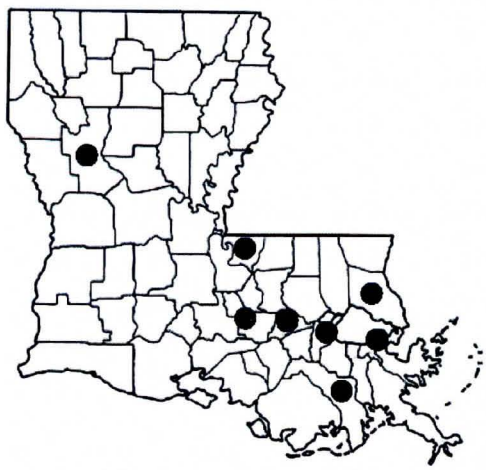

Fig. 3. Parish records for ***D. hyalinata***

Within south Louisiana, ***Diaphania hyalinata*** (Linnaeus) (Fig. 1) appears to have five annual broods occurring at about 35-day intervals, the first brood peaking end of July, beginning of August.

Kelsheimer (1949) considered this insect to be the most important pest of cucurbits in Florida.

Capinera (2000) stated concerning ***hyalinata,*** "moths are not attracted to light traps". Note that all 496 adults captured in this study were captured using light traps. And this quantity is only a small sample of the thousands I have taken in light traps. This same author stated of ova "*hatching occurs after three to four days*", "*total larval development time is about 14 days*", and "*pupal stage persists for nine to 10 days*", a total of approximately 27-28 days, adult to adult. Yilmaz and GenÇ (2012) stated laboratory rearing of ***Palpita unionalis*** (Hübner), occurred over 35-39 days, adult to adult.

Covell (1984) listed the range of ***hyalinata*** to include: "*Quebec to Florida, west to Kansas and Texas, October to November northward, all months except February and December in Florida, where it is common*". Heppner (2003) stated ***hyalinata*** occurs in eastern North America: "*Quebec to Florida and Manitoba to Texas, West Indies, Mexico to Argentina*". Powell and Opler (2009) stated that ***hyalinata*** can be found in Texas, Colorado, and rarely to Arizona and California.

Acknowledgement: I thank James Hayden for reviewing and commenting upon this species account.

Literature Cited

Capinera, J.L., 2000, rev. 2005. Melonworm, *Diaphania hyalinata* Linnaeus (Insecta: Lepidoptera: Pyralidae), Univ. of Florida, IFAS Publication #EENY163.

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.

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.

Kelsheimer, E.G., 1949. *Control of insect pests of cucumber and squash.* Florida Agricultural Experiment Station Bulletin 465. 15 pp.

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

Yilmaz, Ç., and H. GenÇ, 2012. Determination of the life cycle of the olive fruit leaf moth, Palpita unionalis (Lepidoptera: Pyralidae) in the laboratory. *Florida Entomologist*, pgs. 162-170.

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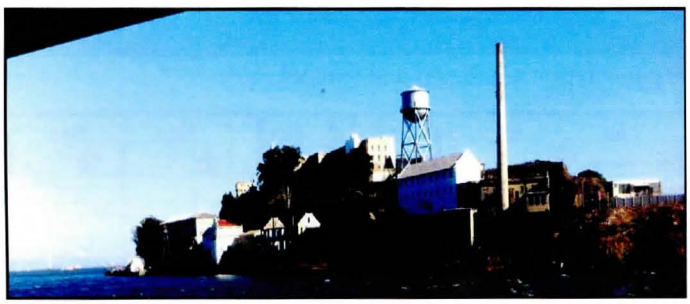

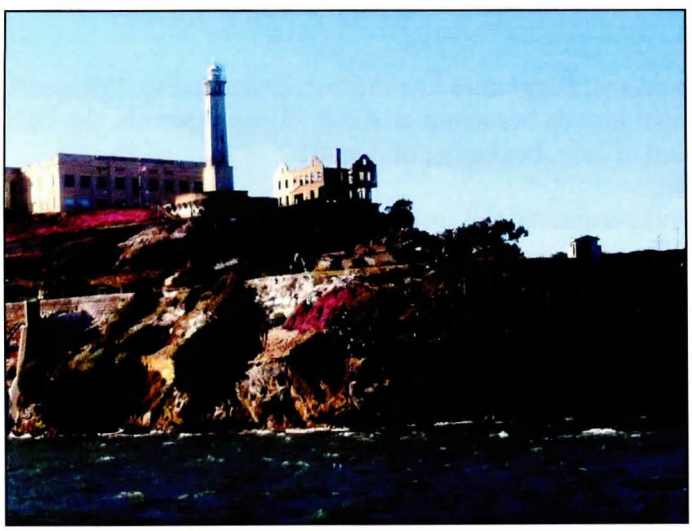

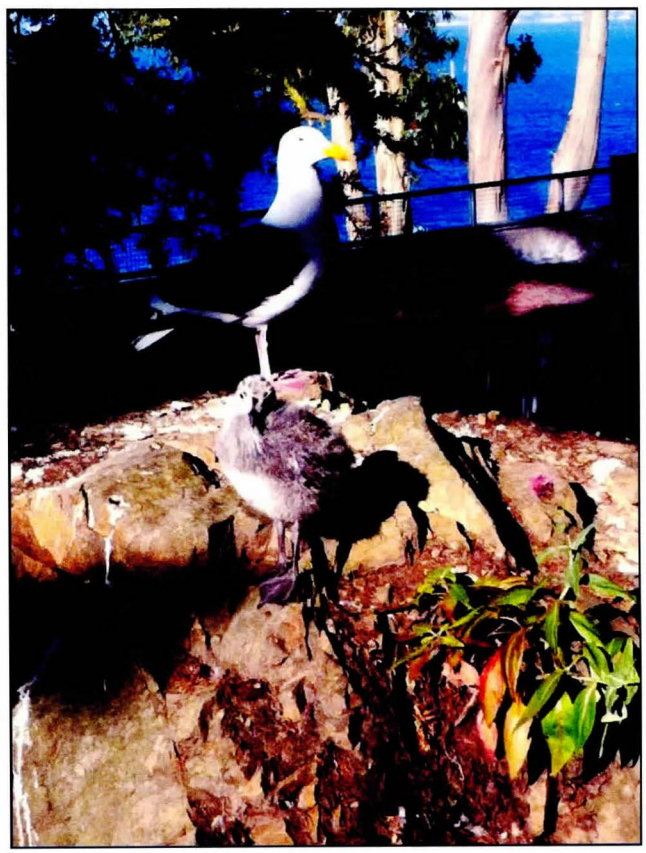

Alcatraz Island in San Francisco Bay. The island has no predators and thus it is an ideal breeding ground for the Western Gull (*Larus occidentalis*) and many other bird species. Alcatraz island was acquired by the United States upon treaty with Mexico (1848). In 1853 fortifications were initiated to protect the City of San Francisco and in 1858 named Fortress Alcatraz. The island became a military garrison, and in 1861 a San Francisco arsenal for storage and protection of weapons during the Civil War. It was used as a prison for Confederate soldier starting in 1861 and continued on as a federal military prison until 1933 when it was acquired by the US Departemt of Justice and became a Federal Prison until 1963. It currently is a major tourist attraction in SF Bay. (https://en.wikipedia.org/wiki/Alcatraz_Island)

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BY

DAVID FINE

Since 2003, my Lepidoptera efforts have developed an extremely narrow focus from wanting to see every bug on the face of the earth to specializing on moths of Monroe County, Florida, otherwise known as the Florida Keys. I've written extensively in the past regarding the heart and history of the project, so I won't go into that so much other than to say that the last 13 years have truly been an amazing experience as I have begun to become intimately familiar with the Lepidoptera of this 100 mile strip of Islands in Southernmost Florida.

In 2011, Howard Grisham and I published in the Southern Lepidopterists' Society News Letter, some initial findings of a 9 year project in North Key Largo as we surveyed Crocodile Lake National Wildlife Refuge. Shortly after that came out, I received a document entitled; *"Rare, Declining, and Poorly Known Butterflies and Moths of Forests and Woodlands in the Eastern United States"* (By: Schweitzer, Minno and Wagner). As I was thumbing through this impressive document, I read on pages 67 and 68 a section entitled; "Tropical Pinelands (Pine Rocklands)" where it describes the decline of the famous South Floridian butterfly species of this habitat (*Euphyes pilatka klotsi*, *Ephyriades brunnea floridensis*, *Strymon acis bartrami* and *Anaea troglodyta floridalis*). At the end of this section on page 68 however, there was a phrase that caught my attention; "The nocturnal moth fauna of pine rocklands is very poorly documented." After reading this, it became obvious to me that creating awareness and understanding around the moths of this habitat in the lower Keys would be my calling. At that point, we contacted the US Fish and Wildlife authorities in Key Deer National Wildlife Refuge and began to devise a plan to gain understanding on the moths of the Pine Rockland habitats of the Lower Keys. To date we have identified 525 species of moths in this surveying effort throughout the Keys and rarely is there a night when lights are placed out in the hammocks or pinelands that a new species to the project doesn't show up.

We purchased some macro photography equipment last year and this has drastically improved the quality with which we can share our findings with folks. In November, my dear friend Luis Vinals convinced me that I needed to start a website to document my findings and have a place where the multitude of images that we are capturing can be housed and shared for public use. At first I thought that it would never work because I neither have the margin of time to manage a website with the amount of data that would be necessary to make it at all interesting nor do I have the know-how to do web building but never-the-less, he sat me down one night and he walked me through building 2 or 3 simple pages. Within an hour or two, my little mind started racing with ideas and excitement. It was at this time that the idea for "KEYSMOTHS.COM" was birthed. That was in November of 2015. Since then, my lovely wife has put up with sharing me with my computer in my spare time and finally, 9 months later, I feel that the website is ready to open to the public as a never-ending, always evolving tool to document the project (Figs. 1 and 2).

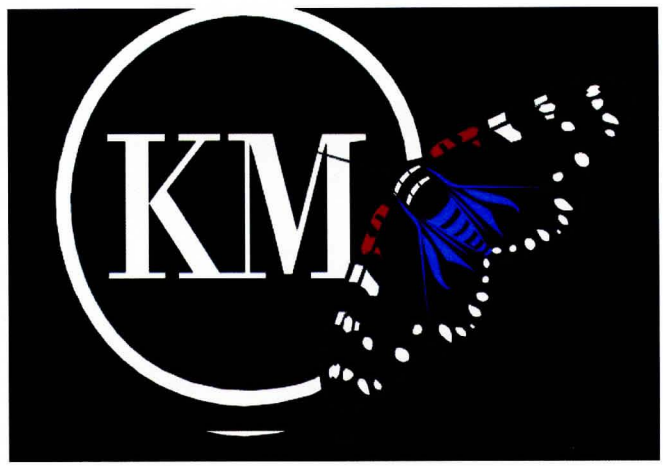

Fig. 1. Logo for web site.

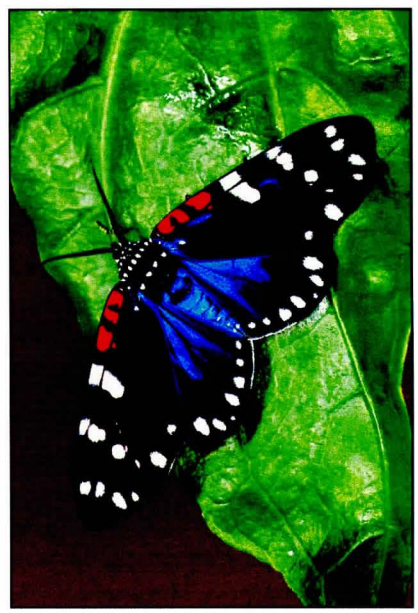

Fig. 2. *Composia fidelissima* (Photo used for website.)

The Goal of this site is to create a platform where this information can be readily available to anyone who is interested in the moth fauna in the Keys. To be honest, as I have amounted a massive photo library, I felt quite convinced that it wasn't being shared to the community. As already stated, we are finding new things to the project all the time and we have a strong bent towards documenting

life cycle history for as many species as possible. That means lots of caterpillar hunting! For example, while down on Big Pine Key in March of this year, I found a fully mature Notodontid larva feeding on Poisonwood. I looked up the life histories of the notodontids that I had seen in the area and couldn't find any host records for them. After rearing the larva through, it turned out to be *Nystalea eutalanta* (Figs. 3-5). Right next to that

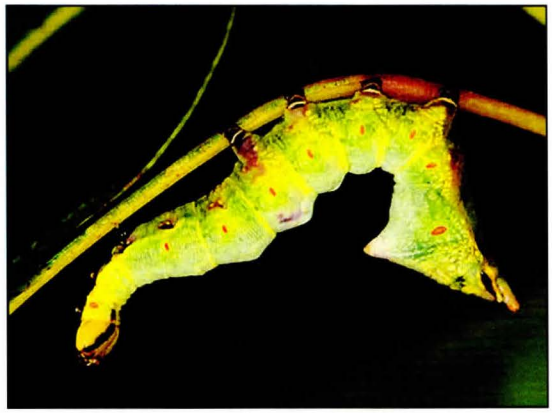

Fig. 3. *Nystalea eutalanta* larva

Fig. 4. *Nystalea eutalanta*

Fig. 5. *Nystalea eutalanta* adult

poisonwood tree was a small sea grape tree with new growth. There were several leaves rolled over with larvae inside. We took those home as well and reared them through and they turned out to be *Phaedropsis stictigramma*, a beautiful Pyralid of the tropics (Figs. 6-8). When it comes to the light rig mothing, spending this time in the Keys is exciting because you never

Fig. 6. *Phaedropsis stictigramma* larva

Fig. 7. *Phaedropsis stictigramma* larval housing

Fig. 8. *Phaedropsis stictigramma* adult

know what you are going to find. We have found a few gems over the past few years that are worth noting including this beautiful *Eudocima apta* (Fig. 9) which we found in March on Big Pine Key. This is the first *E. apta* that I have ever seen. We have also found *Syntomeida syntomoides*, (Fig. 10) a beautiful Arctiid moth that is newly found on US soil. We have found it on Big Pine Key, No Name Key (and Jim Troubridge reports a few found on Bahia Honda Key). *Neotuerta hemicycla* (Fig. 11) has been a species that we have found only 3 of on Key Largo in nine years of surveying. We have not seen it in the lower Keys at all until one night in June when over 40 individuals showed up. This beautiful noctuid has only been found in the Florida Keys and in Cuba.

Fig. 9. *Eudocima apta*

Fig. 10. *Syntomeida syntomoides*

Fig. 11. *Neotuerta hemicycla*

Fig. 12. *Phrygionis auriferaria*

Fig. 13. *Pseudocharis minima*

Fig. 14. *Xylophanes pluto*

Fig. 15. *Aellopos tantalus*

Fig. 16. *Boryzops purissima*

Fig. 17. *Cocytius antaeus*

While there are many more species that we have found that are highly specific in range, isolated to Southernmost Florida and the Keys, there are lots of other interesting bugs that have showed up such as; *Phrygionis auriferaria* (Fig. 12), *Pseudocharis minima* (Fig. 13) is actually abundant in the lower Keys, *Xylophanes pluto* (Fig. 14), *Aellopos tantalus* (Fig. 15), *Boryzops purissima* (Fig. 16) and much much more. We have a page entitled "UFO'S" where we place photos of specimens found that we are in the process of identifying. It can be challenging finding an ID on this group, particularly with the Caribbean species. While my specialty is certainly not micro-lepidoptera, we are recording moth species of all families from *Cocytius antaeus* (the Giant Sphinx) (Fig. 17) at 170mm wingspan all the way down to a beautiful little 4mm iridescent purple micro species. It could be *Stigmella ostryaefoliella* (Fig. 18) but is colored differently than other specimens photographed.

Fig. 18. *Stigmella ostryaefoliella*

We have become heavily focused on education. With my beautiful wife, Noemi, and our two awesome kids Lorenzo (7) and Sofia (8) by my side, I've found a joy and passion for sharing this amazing hobby with my family and just about anyone else that is interested. Our survey outings often include families and friends that are not at all bug enthusiasts, but simply want to

come and "check it out". We have also been invited several times by USFW folks to conduct public educational outings in the Keys such as "Outdoor Fest" in March of this year. In two evenings on Key Largo and Big Pine Key, we had a combined 75 people hanging out at the lights checking out what shows up (Figs. 19 and 20). On Big Pine Key, we actually had an 11 year old child find a moth that came to the sheet that was totally new to the project. It was the first time we had seen this particular species.

I want to state now that this site is in development so if you happen to stumble upon a misspelling or a page that looks discombobulated, I would like to apologize in advance and would love to fix it as soon as possible. I have had several of my mothing peers review the site at their leisure and they have helped me identify many of the "UFO's" that I had as well as misidentifications. For this effort I want to give special thanks to the following folks: Jim Vargo, Jim Troubridge, Charles Covell, Leroy Koehn, James Hayden and Bob Belmont. With that being said, some of the groups have been quite difficult to come to final identifications on so I welcome anyone who sees a miss-identification OR if you have data/photographs/lifecycle information etc... from experiences with moths in the Keys that can be added to the site, please feel free to email me at david@keysmoths.com. Any information or photographs that would be sent would receive due credit if placed on the site. I welcome the correspondence. I feel that we are just scratching the surface as to understanding the moths of the Keys so I believe that this is a long-term project that may never be fully completed. I want to thank my lovely wife Noemi for always supporting me in this effort, my kids for making awesome mothing company, Luis and Jasline Vinals for providing support and vision in a multitude of ways, Howard Grisham for playing a huge role particularly in the Key Largo project, Jeff Denis and Mark Walker for just being faithful friends and support, Alan Chin-Lee, Curtis Copeland and Justus Martin for helping me develop my macro-photography skills (I've still got a ways to go but it's going well!). I thank the amazing friends I've made in Monroe County in the US Fish and Wildlife Service such as Kristie Killam, Jeremy Dixon and Adam Emerick who have been incredibly supportive in these efforts and most of all, I am thankful to God for His marvelous creation that we have the privilege of exploring. The website, as it stands now, is just the starting line of a marathon of research and understanding. I look forward to seeing what we turn up next down in the Keys. I hope you enjoy the site.

Fig. 19. "Outdoor Fest" (March 2016) on Big Pine Key

Fig. 20. "Outdoor Fest" (March 2016) on Big Pine Key

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PALPITA FLEGIA (CRAMER, 1777) (LEPIDOPTERA: CRAMBIDAE) IN LOUISIANA

BY

VERNON ANTOINE BROU JR.

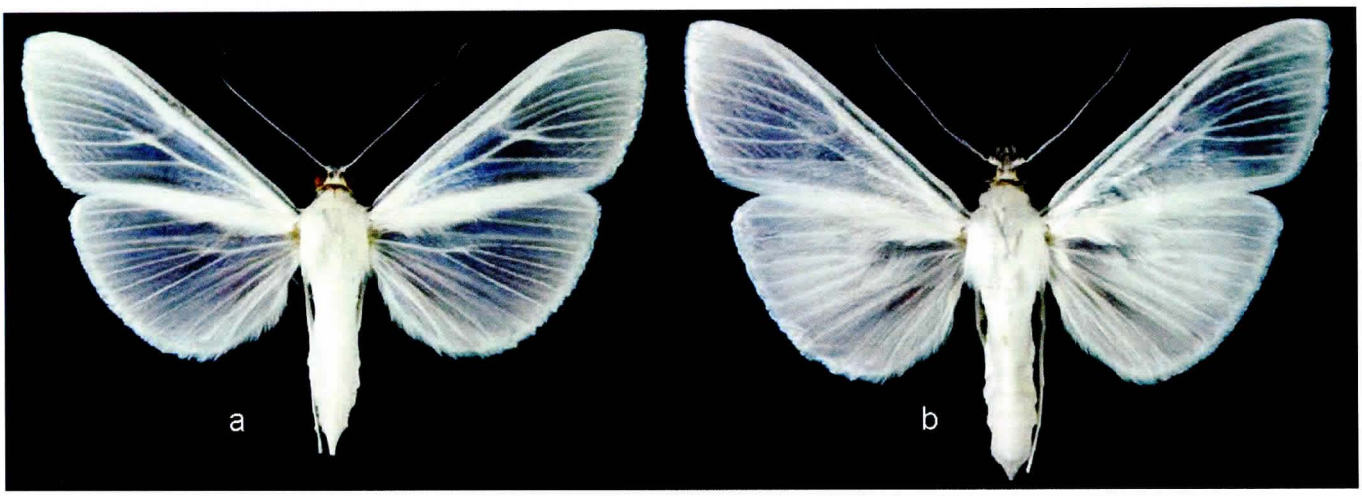

Fig. 1. ***Palpita flegia*** phenotypes: a. male, b. female.

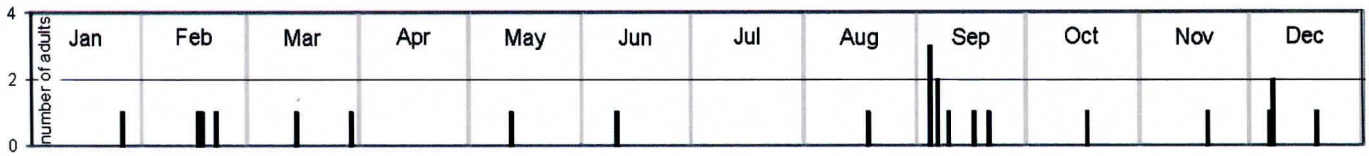

Fig. 2. Adult ***P. flegia*** captured in Louisiana. n = 23

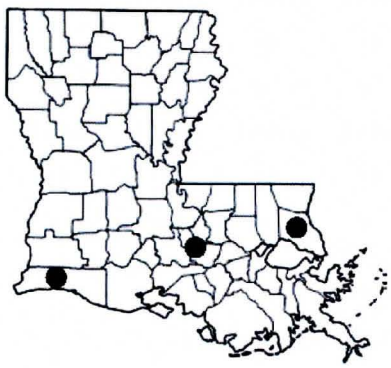

Fig. 3. Parish records for ***P. flegia.***

The huge pyralid moth ***Palpita flegia*** (Cramer, 1777) (Fig. 1) is a species occasionally encountered in ultraviolet light traps within Louisiana. The small sample of adults listed here (19 males and four females) represent all of the good quality specimens I have seen of it over the past half century (Fig. 2). The parish records are illustrated in Fig. 3. This species was not covered by Covell (1984). Male specimens are about 2½ % smaller in size compared to females. Also, all four wings of males are much more transparent than on females, which have somewhat of a woolly appearance. This handsome satin-white, well known and striking species is more often encountered in the southern areas of the coastal states bordering the Gulf of Mexico. A unique characteristic of this species is that the costal border of the forewings has a contrasting streak of light pastel blue color. Hayden, J.E. & L. Buss (2012) provide a key for ***Palpita*** species.

Heppner (2003) and others listed the range of ***flegia*** to include the southern US: Florida to Texas, the West Indies, and Mexico south to Surinam, Argentina, Peru, and Brazil. Roque-Albelo and Landry (2006) listed ***flegia*** from the Galapagos Islands, Ecuador. The larval foodplant is reported to be ***Oleander*** species. In some areas of Louisiana, ***Oleander sp.*** are occasionally planted on highway medians along interstate corridors, though only yellow ***Oleander, Cascabela thevetia*** (L.) Lippold = (***Thevetia peruviana*** Schum.) (*wikipedia.org*) is documented as the larval foodplant. Dekle (1963) stated that the larvae of ***flegia*** (yellow ***Oleander*** caterpillar) has been collected in every month of the year in Florida.

Literature Cited

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.

Dekle, G.W., 1963. *Yellow Oleander Caterpillar (Palpita Flegia (Cramer)) (Lepidoptera: Pyralidae).* Fla. Dept. Agr. Entom. circ. No.12.

Hayden, J.E. & L. Buss, 2012. *Olive shootworm (Palpita persimilis) in Florida.* Florida Dept. Agric. and Consumer Serv., Div. of Plant Industry, Entomology Circular Number 426, 6 pp.

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.

Roque-Albelo, and **L., B.Landry,** 2006. *Lista annotada de los Lepidópteros de las islas Galápagos, Ecuador.* Charles Darwin Research Station, Puerto Ayora, Ecuador, 32 pp.

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

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Junsuk Kim of Alexandria, Louisiana, at Kisatchie National Forest, light trapping field trip on July 4-6, 2016. (Vernon Brou behind camera.)

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Dwarf Zinnias from the Garden of Gary N. Ross in Baton Rouge, Louisiana (2016)

REPORTS OF STATE COORDINATORS

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

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

David Rupe sends in the report that he captured and released a female Dion skipper (*Euphyes dion*) on a moist hillside dominated by Caric sedges and *Scirpus* sp. near his house on Cove Creek Road near Prairie Grove, Washington, County, Arkansas (June 17, 2016). Very local species in this part of the world.

David further reports that he did a little driving around south of his place in the Ozark National Forest and found the following: *Autochton cellus* nectaring on *Pycnanthemum albescens* (individual was captured and released), Crawford County, Cove Creek Road, 35.73198 -94.41276, 6-August-2016.

Autochton cellus

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

Florida Lepidoptera records, June-August 2016. Charlie, coordinator, sends in this report:

Covell's records from May 25 to August 29, 2016, in Gainesville, Alachua Co., FL:

P. troilus, May 25, 28, June 1, 15, July 4, 16, 31, August 5, 20, 24, 27
H. cresphontes, May 25, 27, June 29, 30, July 4, August 20, 27
D. plexippus, May 26, June 15, 17, 29, July 15, 20, 22, 27, August 2, 10, 24
A. vanillae, May 27, June 1, July 15, 27, August 2, 10, 20
P. philea, May 28, July 22
P. palamedes, June 1
J. coenia, June 1, 15, 17
H. charithonia, June 1, 15, 18, 20, 29, July 4, 16, 22, 27, 31, August 10, 28
E. horatius, June 18, July 15, 27, August 10
P. glaucus, June 18, 20, August 5, 24, 27
A. clyton, June 20
H. phyleus, June 29, July 4, 16, 20, 22, August 20, 24, 27
C. cecrops, July 4
L. cassius, July 4
A. nicippe, July 20, August 20
U. proteus, July 20
A. capucinus, July 22
P. sennae, July 27, August 20, 24, 27
L. archippus, July 27, August 10
B. polydamas, August 5
A. logan, August 27

At Austin Cary State Park in Alachua County David Plotkin collected *Leptostales laevitaria* and *Idaea violacearia* (Geometridae).

Jeff Slotten recorded the following moths at his home in Gainesville: *Parapamea buffaloensis*, Aug. 24; *Catocala lachrymosa*, July 15, 24, Aug. 4, 18; *Paonias excaecatus*, Aug. 23; *Xylophanes pluto*, Aug. 13; *Manduca rustica*, Aug. 23; and *Citheronia sepulchralis*, Aug. 22. He reports Saturniidae regularly present during the year: *Eacles*

imperialis, Automeris io, Hyalophora cecropia, Antheraea polyphemus, Actias luna, Callosamia securifera, and *Anisota virginiensis*. He has not seen *Citheronia regalis* since 2012, and this was the first *C. sepulchralis* he's seen since that time.

Barbara Woodmansee reported the following list from the Nature Drive, Lower Suwannee National Wildlife Refuge, Levy County, on Aug. 27: *Epargyreus clarus, Erynnis horatius, Anatrytone logan, Problema byssus, Papilio troilus, P. palamedes, Eurytides marcellus, Phoebis sennae, Zerene cesonia, Eurema daira, Abaeis nicippe, Pyrisitia lisa, Hemiargus ceraunus, Strymon melinus, Phyciodes tharos, P. phaon, Junonia coenia, Anartia jatrophae, Limenitis archippus, Hermeuptychia sosybius,* and *Danaus gilippus.* Later she visited nearby Cedar Key and along the little road that runs parallel to the main road across from where 347 turns toward LSNWR she recorded *Panoquina panoquin, P. ocola, Wallengrenia otho, Ascia monuste, Brephidium pseudofea, Callophrys gryneus sweadneri, Strymon melinus, Calycopis cecrops,* and *Asterocampa celtis.* Many of these species were visiting the profuse *Bidens* (Spanish needles) blossoms.

I am happy to report that Barbara has recovered fully from a water moccasin bite on her toe which she suffered early in the summer!

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Eric Anderson sends in the following report for 3 Florida counties:

Alachua County

Scarlet-bodied Wasp Moth, *Cosmosoma myrodora* 8/22/16
Yellow-Banded Wasp Moth, *Syntomeida ipomoeae* 8/28/16
Black-Winged Dahana, *Dahana atripennis* 8/15/16
Southern Flannel Moth, *Megalopyge opercularis* over 40 blacklighting, 8/28/16
White Flannel Moth, *Norape ovina* 8/18/16
Dot-Lined White, *Artace cribraria* 8/18/16
Mournful Sphinx, *Enyo lugubris* 8/16/16
Rosy Maple Moth, *Dryocampa rubicunda* 8/20/16
Imperial Moth, *Eacles imperialis* 8/14, 8/28/16
Polyphemus Moth, *Antheraea polyphemus* 2 F, 1 M 8/28/16
Io Moth, *Automeris io* 5 M 8/28/16
Giant Leopard Moth, *Ecpantheria scribonia* 8/28/16

Levy County

Southern Dogface, *Zerene cesonia* 8/19/16
Delaware Skipper, *Anatrytone logan* 8/19/16
Southern Skipperling, *Copaeodes minima* 8/19/16
Ceraunus Blue, *Hemiargus ceraunus* 8/19/16

Miami-Dade County

Mallow Scrub-Hairstreak, *Strymon istapa* 7/09/16
Tropical Buckeye, *Junonia evarete* 7/09/16

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

James sends in the following report:

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

Carbondale, I-75 exit 326, Whitfield Co.:
SATURNIIDAE: *Citheronia sepulcralis*, Aug. 10; *Citheronia regalis*, Aug. 15 (LATE and quite fresh, first time I've collected *regalis* after a second brood specimen of *sepulcralis*). **SPHINGIDAE**: *Manduca jasminearum*, Aug. 22. **NOCTUIDAE**: *Argyrogramma verrucae,* Aug. 10.

Rocky Face Ridgeline, Just SW of Dalton, Whitfield Co.:
Aug. 9:
EREBIDAE: *Grammia figurata* (common), *Cycnia collaris* (formerly *inopinatus*; COUNTY), *Catocala ulalume*.
NOCTUIDAE: *Acronicta fallax, Cucullia asteroides* (NOT common), *Dipterygia rozmani, Properigea* nr. *costa*.
Aug. 25-26:
GEOMETRIDAE: *Tornos scolopacinarius*. **NOCTUIDAE**: *Schinia nundina*.

Calhoun, Gordon Co. (my house), Aug. 8:
NOCTUIDAE: *Acronicta fallax*.

Rome, east side of Hwy1/27, 3.33 mi. N of Loop 1, mixed forest with rare Nutmeg Hickory (Carya myristicaformis), 34°19'34ish" N, 85°10'17ish" W, with Larry Gall, Richard Ware, Aug. 20:
EREBIDAE: *Catocala myristica* (STATE)(Photo on right), *C. luctuosa* (COUNTY).

***Catocala myristica*: top - form "missouriensis"; bottom - form "normal". STATE record!**

Kingsland, Camden Co., 30.78° N , 81.69°W, July 21, Frank Laccone:
EREBIDAE: Melipotis fasciolaris (COUNTY).

Sapelo Island, McIntosh Co:
June 8, JH:
COSSIDAE: *Cossula magnifica* (only one other taken, in May, 2016). **PTEROPHORIDAE**: *Hellinsia balanotes*. **NOCTUIDAE**: *Acronicta brumosa* (new to the ISLAND), *Callopistria granitosa, C. cordata*.
July 8-9, LD:
CRAMBIDAE: *Herpetogramma bipunctalis* (few previous island records), *Euzophera semifuneralis* (few previous island records). **GEOMETRIDAE**: *Hypomecis gnopharia* (new to ISLAND), *Lambdina pultaria, Lobocleta plemyraria* (apparently, the 2nd Sapelo record), *Idaea retractaria* (lots). **SPHINGIDAE**: *Erinnyis obscura* (our 2nd Sapelo record and from the same site as the previous record). **EREBIDAE**: *Pygarctia abdominalis* (few previous island records), *Metalectra quadrisignata* (new to ISLAND). **NOCTUIDAE**: *Phosphila turbulenta* (apparently, the 2nd Sapelo record).
August 5-6, LD:
TINEIDAE: *Monopis pavlovski* (1 previous Sapelo record). **LIMACODIDAE**: *Apoda rectilinea* (few previous Sapelo records), *Adoneta spinuloides* (1 previous Sapelo record). **HESPERIIDAE**: *Anatrytone delaware*. **LYCAENIDAE**: *Brephidium pseudofea* (despite looking for it, we had not recorded this species until this year and now we have records for 4 different months). **GEOMETRIDAE**: *Hypomecis gnopharia* (1 previous July record), *Tornos scolopacinaria* (few previous [March] Sapelo records), *Idaea retractaria* (again).

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

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

All records by Ricky Patterson:

8 August 2016, Natchez Trace Parkway mile 193.1, Choctaw county, *Catocala maestosa, Satyrodes appalachia appalachia*

9 August 2016, Crawford, Lowndes county, *Catocala myristica, Catocala ilia*

10 August 2016, Natchez Trace Parkway mile 190.0, Choctaw county, *Catocala maestosa, Catocala angusi*

10 August 2016, Natchez Trace Parkway mile 251.1, Lee county, *Catocala robinsonii*

15 August 2016, Natchez Trace Parkway mile 225.4, Chickasaw county, *Catocala myristica*

15 August 2016, Natchez Trace Parkway mile 249.6, Pontotoc county, *Catocala robinsonii, Catocala lacrymosa, Catocala illia*

22 August 2016, Vicksburg, Warren county, *Pyrgus oileus*

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

Steve send in the following report for North Carolina:

The following selected moth records were submitted by Allen Ratzlaff (AR), Bo Sullivan (JBS), Brian Bockhahn (BB), Ed Corey (EC), Evan Raskin (ER), Jesse Anderson (JA), Kevin Bischof (KB), Larry Gall (LG), Lori Owenby (LO), Paul Scharf (PS), and Steve Hall (SPH). In addition to ongoing surveys at certain sites, these records come from several National Moth Night events held in Orange and Stokes Counties, from a bioblitz conducted at Mount Mitchell State Park (Yancey County), and from an excursion made by Larry Gall to document populations of *Catocala myristica* along the southern Atlantic Coastal Plain (Pender County).

HEPIALIDAE:
Gazoryctra sciophanes, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS

GELICHIIDAE:
Agnippe biscolorella, JUL 23, Orange, BB (**STATE**)
Anacampsis agrimoniella, JUL 20, Stokes, SPH/BB/PS (**COUNTY**)

MEGALOPYGIDAE:
Norape ovina, JUL 20, Stokes, SPH/BB/PS (**COUNTY**)

LIMACODIDAE:
Heterogenea shurtleffi, JUL 20, Stokes, SPH/BB/PS (**COUNTY**)

GEOMETRIDAE:
Probole nepiasaria,, AUG 10, Orange, SPH
Lobocleta ossularia, JUL 20, Stokes, SPH/BB/PS (**COUNTY**)
Lobocleta plemyraria, JUL 20, Stokes, SPH/BB/PS (**COUNTY**)
Idaea ostentaria, JUN 2, Carteret, JBS
Leptostales rubromarginaria, JUL 20, Stokes, SPH/BB/PS (**COUNTY**)
Dysstroma truncata, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS

URANIIDAE:
Callizzia amorata, JUL 20, Stokes, SPH/BB/PS (**COUNTY**)

SATURNIIDAE:
Callosamia promethea, JUL 20, Stokes, SPH/BB/PS (**COUNTY**)

SPHINGIDAE:
Manduca jasminearum, JUL 20, Stokes, SPH/BB/PS
Sphinx kalmiae, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS
Eumorpha pandorus, AUG 2, Ashe, SPH/JBS

NOTODONTIDAE:
Ellida caniplaga, JUL 20, Stokes, SPH/BB/PS

EREBIDAE:
Crambidia pura/cephalica complex, JUL 20, Stokes, SPH/BB/PS (**COUNTY**)
Spilosoma latipennis, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Apantesis carlotta, AUG 2, Ashe, SPH/JBS
Lophocampa maculata, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Idia denticulalis, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Zanclognatha dentata, AUG 3, Ashe, SPH/JBS
Dinumma deponens, AUG 5, Orange, SPH (**COUNTY**)
Gondysia smithii, JUL 20, Stokes, SPH/BB/PS
Catocala flebilis, AUG 6, Orange, SPH (**COUNTY**)
Catocala angusi. AUG 6, Orange, SPH (**COUNTY**)
Catocala residua, AUG 10, Orange, SPH
Catocala myristica, AUG 23, Pender, LG/JBS/SPH (**STATE**)
Catocala retecta, AUG 3, Ashe, SPH/JBS
Catocala insolabilis, JUN 15, Ashe, SPH/JBS
Catocala lacrymosa, AUG 6, Orange, SPH
Catocala palaeogama, AUG 2, Ashe, SPH/JBS
Catocala nebulosa, AUG 23, Pender, LG/JBS/SPH (**COUNTY**)
Catocala ilia, AUG 2, Ashe, SPH/JBS
Catocala umbrosa, JUN 24, Washington, EC/JA (**COUNTY**)
Catocala marmorata, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Catocala carissima, JUN 24, Washington, EC/JA (**COUNTY**); AUG 23, Pender, LG/JBS/SPH (**COUNTY**)
Catocala amica, AUG 2, Ashe, SPH/JBS

EUTELIIDAE:
Eutelia pulcherrimus, JUN 15, Ashe, SPH/JBS

NOCTUIDAE:
Autographa ampla, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Anagrapha falcifera, AUG 2, Ashe, SPH/JBS
Leuconycta lepidula, AUG 3, Ashe, SPH/JBS
Acronicta superans, JUL 20, Stokes, SPH/BB/PS (**COUNTY**); AUG 3, Ashe, SPH/JBS
Anterastria teratophora, JUN 14, Ashe, SPH/JBS
Apamea nigrior, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Amphipoea americana, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Hyppa xylinoides, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Perigea xanthioides, AUG 3, Ashe, SPH/JBS
Diarsia rubifera, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Diarsia jucunda, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Anaplectoides prasina, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Eueretagrotis attentus, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)
Eueretagrotis perattentus, JUL 28, Yancey, AR/BB/EC/ER/JA/KB/LO/PS (**COUNTY**)

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THIRTEEN MOONS OF MOTHING

BY

JOHN F. DOUGLASS

John (Pick) Pickering's meticulous formulation of a grand scheme for population studies of moths has enlivened recent pages of the SL NEWS (Pickering 2015, 2016; Pickering and Staples 2016). Discover Life's *Mothing* program is a powerful framework which allows students to engage in purposeful approaches to the gathering of nature observations. It is wonderfully-suited for introduction into classrooms and nature centers, especially in that it engagingly joins old-time natural history with powerful digital techniques.

Mothing - The *Mothing* project (www.discoverlife.org/moth) is astonishing in scope: begun in 2010, it is a continent-wide effort involving digital image-capture of specimens at each of 22 study sites in North and Middle America. Just as with Vern Brou's monumental contributions from Louisiana over the years, I find myself reading twice through some of the passages in Pick's work, just to let the orders of magnitude of his samples sink in.

Results - Pick's work has been enormously beneficial in sharpening terminology and laying the groundwork for a whole new approach to the study of moth populations in the wild. It has already helped illuminate several important biological principles, including:

1) the observed decoupling of adult flights from what should properly be called constituent 'egg-broods';

2) the apparent importance of 'pupa banks' (comparable to seed banks in plants) due to the multi-year pupal diapause seen in many species;

3) the likely adaptiveness of differing seasonal flight patterns in cryptic versus aposematic species (which have temporally-diffuse and distinct (synchronized) phenograms, respectively);

4) possible 'temporal vicariance' between northern and southern populations of certain multivoltine, aposematic species (temporally-outlying individuals, between peaks, are at risk);

5) identification of optimal moth-sampling regimes with regard to the lunar cycle.

Pick's scientific temperament is a mixture of extreme biophilia and megadatamania. On the white-stucco walls of his North-Georgia home, he sees a tangled bank of intrigue.

Workshop on Sunday, 30 October 2016 - Please join us for a training workshop, to be held following the ATL-SLS Annual Meeting at the McGuire Center in Gainesville. Pick (pick@discoverlife.org) will present Discover Life's procedures for digital capture of images, assembly of "personal albums", and generating of site-specific identification guides. He will demonstrate how the nightly tabulation of observed numbers of each taxon at all sites allows for easy production of maps, graphs, and tables. He will show how to start a site, begin an album, and manage photographs, and he offers generous follow-up support.

New participants - The observation, made by moth lovers for generations, that nights around the time of a new moon are most-favorable for the accumulation of moths at light, is strongly borne out by the exhaustive analyses by Pick and Tori in their most-recent study in the SL NEWS. They recommend that participants in the *Mothing* program begin by sampling, at minimum, once on the night of each new moon, yielding 13 samples per year.

It would be wonderful if, after the workshop, new study sites might be established, and photo albums begun, with sampling to begin in January 2017. Anticipating a New Year's start-date for what we hope will be new participants' involvement, a new verse might fittingly be added at Christmastime: "Thirteen Moons of Mothing, Twelve Drummers Drumming, ...".

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Sunflowers from the Garden of Gary Ross (early summer 2016) in Baton Rouge, Louisiana

STATUS OF MOTH DIVERSITY AND TAXONOMY: A COMPARISON BETWEEN AFRICA AND NORTH AMERICA NORTH OF MEXICO

BY

JOHN PICKERING, DOROTHY MADAMBA, TORI STAPLES AND REBECCA WALCOTT

Abstract -- We analyzed 21,375 African and 11,799 North American moth species from AfroMoths and Discover Life. For North, West, Central, East and Southern African regions and North America north of Mexico, we compared species totals for selected higher taxa and for when taxonomists published species descriptions. Currently Africa has 1.8 times as many described moths as North America north of Mexico, but this number underestimates the relative richness of African moth diversity. Trends in the annual rate of species descriptions suggest that there are many yet undescribed African moths relative to the United States and Canada. For the "*macro moths*" (Geometroidea, Drepanoidea, Noctuoidea, Bombycoidea, Lasiocampidae) there are 2.3 times as many described African species. For "*other moths*", there are only 1.4 times as many, suggesting that for much of Africa, the relative exception being South Africa, a higher proportion of small species may remain yet undescribed. Notably, there are currently more described species in Tortricidae, Gelechioidea, Yponomeutoidea and Gracillarioidea for North America than Africa. Taxonomists are still describing many new species within charismatic groups of large moths, namely the Arctiinae, Saturniidae and Sphingidae, in East and Central Africa. We frame this article in the context of the *African Moth Inventory*, a new initiative of Discover Life, which we invite Southern Lepidopterists' Society members to join.

Introduction -- With the SLS and other partners, Discover Life's *Mothing* project (discoverlife.org/moth) is building a network of study sites to compare how moth communities differ geographically and respond to environmental factors. This article is the fourth SLN article on *Mothing*. Previously Pickering (2015) gave a project overview and invited SLS members to participate. Pickering (2016) considered how '*pupa banks*' and moth coloration might help explain observed seasonal flight patterns. Also Pickering & Staples (2016) analyzed 1,825 nightly samples from a site in Georgia to determine how to sample moth diversity efficiently. They found that 13 samples/year (3.6% of all nights) taken on each new moon, the most productive night of the lunar cycle, yielded 48% of the 1,256 species recorded by sampling every night.

Mothing has now collected 610,000 photographs on over 3,000 moth species at study sites in eastern North America and Costa Rica. With the help of Moth Photographers' Group and others, it has assembled photographs and provides online identification guides to many North and Central American species. Discover Life is expanding *Mothing* to other places. With the Natural History Museum of Zimbabwe, Bulawayo, and the Sam Houston State Natural History Collections, Huntsville, Texas, we here propose the *African Moth Inventory*.

African Moth Inventory

Our first goal for this initiative is to enhance online tools so that one can rapidly database and identify African moths using photography. We envision developing capabilities for Africa similar to those available for the United States and Canada from Discover Life, Moth Photographers' Group, and related websites. Notably, we plan to build country- and local- level identification guides to African moths that use diagnostic images. Using these tools with sampling protocols, we plan to train participants to inventory parks and other areas. Our ultimate goal is to provide high-quality inventories to policy makers and land managers to help improve nature conservation in Africa.

Our inventory will require authority files of valid taxa, diagnostic photographs, local checklists based on occurrence records, identification guides, and sampling sites. Below we address the first of these requirements, using www.AfroMoths.net, an extensive database of moths in the Afrotropical biogeographic region (De Prins & De Prins 2016). We show the status of African versus North American moth taxonomy with respect to a) 5 regions and 18 selected countries within mainland Africa, b) a phylogeny showing 38 higher taxa, and c) the accumulative number of valid species by year since Linnaeus described the first ones in 1758. This taxonomy is the foundation upon which we will work to address the other requirements.

Methods & Results

Databases

We extracted moth species data from AfroMoths and Discover Life. For Africa we captured all taxon pages served by AfroMoths using a web robot and parsed the data, filtering them for valid species binomials, years of publication, higher taxa, and geographic ranges by country. Of the 27,635 valid moth species served by AfroMoths, we excluded species from Arabia,

Madagascar, and elsewhere that are not explicitly listed with a range on the African mainland. This resulted in a total of 21,375 continental species in 46 countries.

For North America we processed the 12,036 moth species in Discover Life's identification guide and checklist of North America north of Mexico (Pickering 2010), excluding the names of unpublished morphospecies and for which Discover Life's database did not include an occurrence record on the continent north of Mexico. This resulted in 11,799 species.

Discover Life currently has 1.3 million species names in its taxonomic authority files. It attempts to keep these current, but its lists are incomplete and contain errors. Its checklist for North American moths was initially obtained from Nearctica.com (Poole & Gentili 1996-1997) and has been updated with information from Moth Photographers' Group and other sources. As a test of its completeness, we compared its Pyraloidea with Scholtens & Solis's (2015) recent checklist of this superfamily which Discover Life has not yet used to update its names. Scholtens & Solis list 1,542 species (861 Crambidae and 681 Pyralidae). Discover Life has 1,538.

African regions

There is considerable work on the biogeography of Afrotropical butterflies that covers over 4,000 species in sub-Saharan Africa, Arabia, and Madagascar (Ackery et al. 1995; Larsen 2005; Pringle et al. 1994, Williams 2007). This work guided us in clustering moth species into five continental regions to present trends across Africa. Our regions are North, West, Central, East and Southern Africa. As the initial foundation for each, we used the species lists of Egypt, Nigeria, Democratic Republic of Congo, Kenya, and South Africa, respectively. These countries have the longest species lists in their regions. We then iteratively clustered the remaining 41 countries' lists into regions based on the number of species within each country overlapping with those in the growing regions. To reduce statistical issues associated with differences between regional sample sizes, we attempted to add country lists such that the number of species in each region remained similar. This was largely possible for Central, East and Southern Africa which finally totaled 7,903, 8,847, and 8,563 species, respectively, but not for North and West Africa which finally totaled 1,223 and 4,346, respectively.

Table 1 presents the overlap in species across the five regions and 18 selected countries (Egypt, Sudan, and the 16 countries with lists exceeding 1,000 species). Details on each region are given below and shown on the map, with the circles increasing in size with the number of species in each country list.

North Africa (cyan) includes Algeria, Egypt, Western Sahara, Chad, Mali, Mauritania, Niger, Sudan (Morocco, Tunisia and Libya). In considering butterflies, Larsen (2005) includes Mali, Mauritania and Niger in West Africa. As these three countries are largely desert, we lumped them in with North Africa based on relatively few species: 59, 217, and 213 species, respectively. AfroMoths had no records for Morocco, Tunisia and Libya.

		North	EG	SU	West	GH	NI	SL	Cent.	AO	CM	CG	GB	East	ET	KE	MI	TZ	UG	ZA	South.	MZ	SF	ZI
North		**1,223**																						
Egypt	EG	423	**423**																					
Sudan	SU	648	162	**648**																				
West		456	102	275	**4,346**																			
Ghana	GH	188	37	110	1,442	**1,442**																		
Nigeria	NI	297	54	182	2,109	677	**2,109**																	
Sierra Leone	SL	151	28	89	1,258	491	546	**1,258**																
Central		398	78	248	2,224	930	1,193	808	**7,903**															
Angola	AO	131	24	90	467	266	309	208	1,095	**1,095**														
Cameroon	CM	172	29	102	1,225	578	720	511	2,559	357	**2,559**													
D.R. Congo	CG	320	68	203	1,604	733	891	630	5,100	615	1,200	**5,100**												
Gabon	GB	59	11	33	621	314	367	260	1,245	191	648	645	**1,245**											
East		556	143	378	1,686	732	915	628	3,095	674	1,025	2,502	423	**8,847**										
Ethiopia	ET	265	75	201	431	181	263	164	593	188	237	482	79	1,545	**1,545**									
Kenya	KE	374	95	258	921	421	507	361	1,586	409	565	1,287	200	3,685	698	**3,685**								
Malawi	MI	191	39	133	574	271	344	240	962	332	324	825	117	1,839	298	783	**1,839**							
Tanzania	TZ	280	64	200	763	340	433	310	1,371	408	498	1,150	194	3,066	533	1,314	824	**3,066**						
Uganda	UG	241	44	175	901	462	554	392	1,572	359	701	1,301	296	2,508	401	1,132	527	805	**2,508**					
Zambia	ZA	170	31	123	490	212	271	224	928	333	274	811	123	1,452	248	623	651	661	412	**1,452**				
Southern		400	113	266	1,063	411	556	407	1,772	490	469	1,455	170	2,657	575	1,497	1,118	1,263	805	996	**8,563**			
Mozambique	MZ	154	39	102	411	193	228	185	672	245	222	583	83	960	235	600	602	581	348	558	1,364	**1,364**		
South Africa	SF	353	104	230	890	350	475	348	1,414	398	376	1,162	135	2,103	513	1,265	877	1,017	657	771	6,810	914	**6,810**	
Zimbabwe	ZI	243	58	166	632	263	346	267	1,118	368	325	943	117	1,632	390	952	866	877	539	849	2,563	842	1,717	**2,563**

Table 1 -- Overlap in moth species across Africa.
Values are for 5 regions (pink cells) and 18 countries. The bold values along the diagonal give total species. The remaining values give the number overlapping. The green cell value of 1,287, for example, is the number of Kenya's 3,685 species that overlap with the Democratic Republic of the Congo's (column CG) 5,100.

Map - Five African moth regions as of 2016.

West Africa (orange) includes Benin, Burkina Faso, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Nigeria, Senegal, Sierra Leone and Togo. Based on butterflies, Larsen (2005) includes parts of Cameroon as West Africa. The values in Table 1 tend to confirm Cameroon as the transitional country between our East and Central regions. Of the 2,559 moth species in Cameroon, 1,225 occur in West Africa and 1,200 in the Democratic Republic of Congo.

Central Africa (blue) includes Angola, Burundi, Cameroon, Central African Republic, Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon and Rwanda.

East Africa (red) includes Djibouti, Eritrea, Ethiopia, Kenya, Malawi, Somalia, South Sudan, Tanzania, Uganda and Zambia.

Southern Africa (green) includes Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland and Zimbabwe. Based on butterflies, Ackery et al. (1995) consider Southern Africa to extend from the Cape to Cunene River (on the southern border of Angola) in the west and to the Zambezi River (splitting Mozambique) in the east. Based on the overlap of moth species, we clustered Mozambique in Southern Africa.

Phylogeny

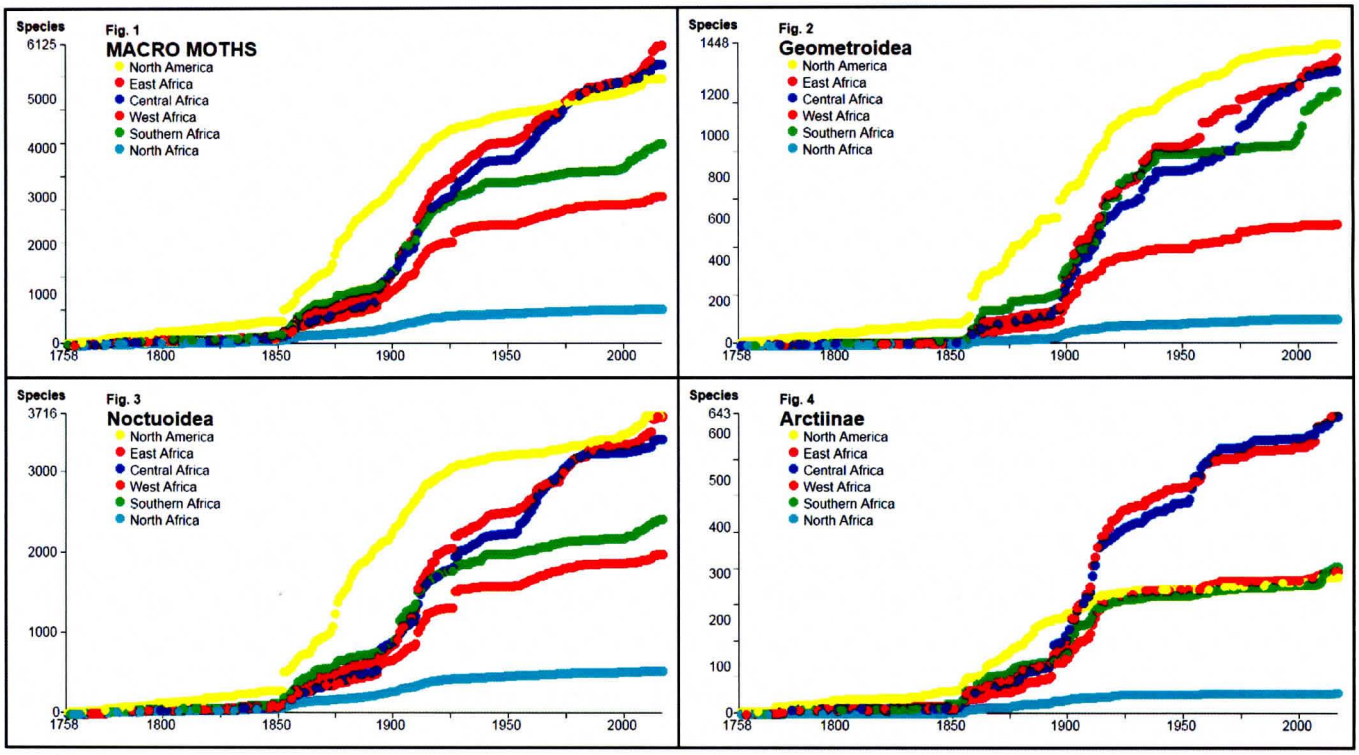
We tabulated all species into higher taxa based on the list at discoverlife.org/moth/highertaxa.txt These higher taxa follow the phylogeny for Lepidoptera of the Tree of Life web project (tolweb.org). Notably we divide moth species into *macro moths* (Geometroidea, Drepanoidea, Noctuoidea, Bombycoidea, Lasiocampidae) and *other moths*, the micros and primitive groups. Table 2 presents the number of *macro moths* and *other moths* for Africa, North America north of Mexico, and the five African regions. It also gives the number of described species in 36 selected superfamilies, families, and subfamilies. We tallied values for all species within their appropriate higher groups but only show selected higher taxa. Thus, for example, we added the Arctiinae values to Erebidae (not shown), Noctuoidea, and *macro moths*. The *ratio* column is the multiplier of Africa (pink) and North America (green) values. Its cells are pink when there are more African species and green with more North American. For example, there are 29.3 times as many African than North American species in Lymantriinae (Noctuoidea: Erebidae).

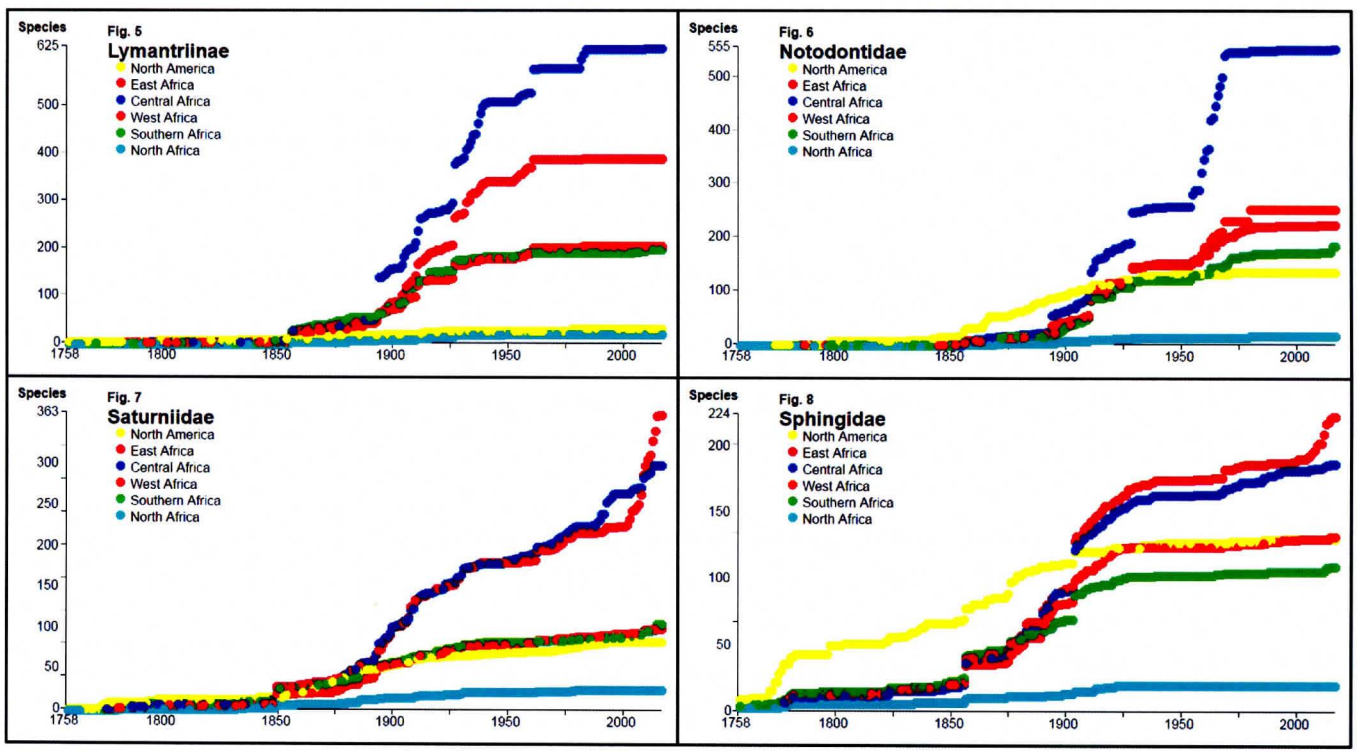
Table 2	Africa	North America	ratio	North Africa	West Africa	Cent. Africa	East Africa	South. Africa
Total	21,375	11,799	1.8	1,223	4,346	7,903	8,847	8,563
MACRO MOTHS Fig.1	12,788	5,444	2.3	756	3,042	5,736	6,125	4,123
Geometroidea Fig.2	3,092	1,448	2.1	126	583	1,319	1,384	1,220
Noctuoidea Fig.3	7,863	3,716	2.1	552	1,998	3,431	3,709	2,436
Arctiinae Fig.4	1,201	298	4.0	48	310	642	643	320
Lymantriinae Fig.5	997	34	29.3	23	209	625	392	201
Nolidae	605	28	21.6	26	189	202	300	150
Notodontidae Fig.6	824	138	6.0	19	256	555	227	187
Bombycoidea	1,135	223	5.1	49	284	627	698	295
Eupterotidae	218	0	-	1	39	111	78	65
Saturniidae Fig.7	565	86	6.6	27	102	302	363	108
Sphingidae Fig.8	300	132	2.3	21	134	188	224	111
Lasiocampidae	645	36	17.9	29	151	319	314	166
OTHER MOTHS Fig.9	8,587	6,355	1.4	467	1,304	2,167	2,722	4,440
Thyrididae	188	12	15.7	9	74	120	112	67
Pyraloidea Fig.10	2,404	1,538	1.6	248	507	729	759	1,084
Crambidae	1,283	859	1.5	104	312	533	543	500
Pyralidae	1,120	679	1.6	144	195	196	215	583
Tortricidae Fig.11	841	1,317	1.6	17	180	209	341	303
Zygaenoidea	637	101	6.3	13	129	294	247	195
Limacodidae Fig.12	423	52	8.1	10	105	183	171	126
Pterophoridae	315	161	2.0	14	36	95	194	170
Sesioidea	256	130	2.0	1	41	61	98	98
Cossoidea Fig.13	400	48	8.3	33	79	102	167	135
Gelechioidea Fig.14	1,717	1,808	1.1	61	89	229	311	1,253
Coleophoridae	97	284	2.9	3	2	16	24	65
Cosmopterigidae	125	171	1.4	11	10	27	20	82
Gelechiidae	725	881	1.2	16	33	79	83	611
Lecithoceridae	120	0	-	3	16	35	35	54
Oecophoridae	116	187	1.6	1	2	11	6	99
Scythrididae	274	43	6.4	14	9	12	93	175
Yponomeutoidea	132	240	1.8	3	8	31	35	85
Gracillarioidea Fig.15	280	413	1.5	5	30	26	62	198
Gracillariidae	251	302	1.2	4	29	25	60	174
Tineoidea Fig.16	895	218	4.1	59	111	218	310	448
Acrolophidae	0	69	-	0	0	0	0	0
Psychidae	278	25	11.1	19	31	70	94	126
Tineidae	550	124	4.4	40	78	143	205	263
Nepticulidae	136	96	1.4	1	9	0	2	124

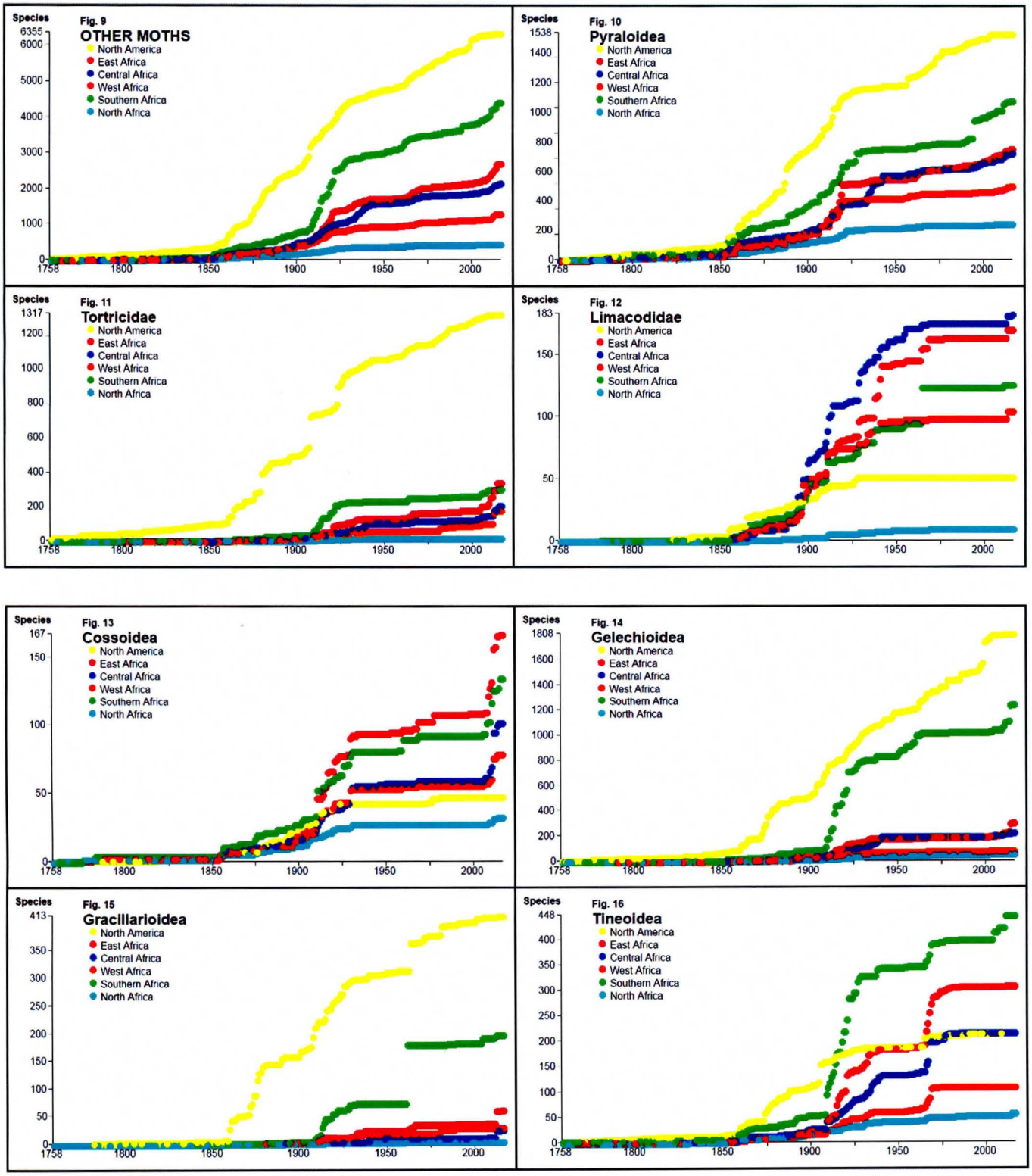
African and North American moth species tabulated by higher taxa.

Accumulated species published by year

For the North American species and five African regions Figures 1 - 16 present the annual accumulation of valid species names published by taxonomists, starting with Linnaeus in 1758. They are listed in Table 2 and cover *macro moths* (in total, plus Geometroidea, Noctuoidea, Arctiinae, Lymantriinae, Notodontidae, Saturniidae, Sphingidae treated individually) and *other moths* (in total, plus Pyraloidea, Tortricidae, Limacodidae, Cossoidea, Gelechioidea, Gracillarioidea, Tineoidea treated individually).







Discussion

Four factors greatly influence our knowledge of species richness and distribution across geographic scales: 1) the underlying biological and environmental processes over millions of years that drive species diversity and distributions, 2) taxonomic naming, the completion of which differs across regions and higher taxa for numerous economic, political, and social reasons, 3) inventory effort to record what's where and when, once species have names, and 4) informatics and dissemination, which have a time-lag in gathering, integrating, and presenting data from the multitude of available sources. So, that said, *caveat emptor*. Our results show moth biogeography across continents through the fog of incomplete taxonomy and informatics!

We begin with a cautionary note of the importance of changes in human effort. Our results reflect in part how the Second World War impacted the taxonomy of African moths more than for the United States and Canada. Taxonomists published 1,545 new African species between 1929-1939, which dropped to 365 between 1939-1949, and recovered to 829 between 1949-1959. For the United States and Canada, the comparable numbers for these respective decades are 271, 300, and 199.

Table 1 is a first approximation in the overlap of species between African regions and countries. It is based only on the countries listed for each species in AfroMoths. Our next step is to refine this table by including existing occurrence records from the Global Biodiversity Information Facility (GBIF), digitizing museum collections, partnering with relevant websites, and eventually, inventorying moths at parks and other sites.

Table 2 shows that continental Africa has a larger moth fauna than North America north of Mexico, with totals in the source databases when accessed being 21,375 and 11,799, respectively, or 1.8 times as many moths in Africa than North America. This comparison is beset with two major problems. First, it lacks Mexican data and the associated tropical species richness of North America. Secondly, as shown by Figures 1 - 16, the completion of taxonomic naming differs considerably across higher taxa and regions.

In general our results show that there are large differences between the African and North American rates of species publications across taxa. While *macro moths* are still being described in the United States (Fig. 1), particularly for the Geometroidea (Fig. 2) and Noctuoidea (Fig. 3), the naming of large, charismatic species is largely complete, as is shown for the Arctiinae (Fig. 4), Lymantriinae (Fig. 5), Notodontidae (Fig. 6), Saturniidae (Fig. 7) and Sphingidae (Fig. 8). This is not true for Africa where large numbers of these higher taxa, except for the Lymantriinae and Notodontidae, are being described, particularly for East and Central Africa (red and blue points).

Fig. 9 compares the overall trends for *other moths*. For the most part, new species descriptions have slowed in the last decade for the United States and Canada, a trend that may be because alpha taxonomy is less fashionable than it once was, rather than nearing completion in describing all species. The Pyraloidea (Fig. 10) show strong recent taxonomy in Africa, especially for the Southern region. The Tortricidae (Fig. 11) may reflect minimal work in Africa until recently, as shown by the recent increase for East Africa. The Limacodidae (Fig. 12) show no increase in species for decades in North America but recently have some new descriptions published for Africa. Cossoidea (Fig. 13) are flat for North America but are still being described in numbers within Africa. The small micros in the superfamilies Gelechioidea (Fig. 14), Gracillarioidea (Fig. 15) and Tineoidea (Fig. 16) show growth in numbers, particularly for Southern Africa. Their values caution that all the growth curves depend on the productivity of individual taxonomists. For example, Fig. 15 has a large step for Southern Africa (green) when Vári (1961) published 106 new species in Gracillarioidea.

In terms of family level biogeographical absences and large differences shown in Table 2, there are no Eupterotidae and Lecithoceridae in North America north of Mexico and no Acrolophidae in Africa. There are over 6 times as many Lymantriinae, Nolidae, Saturniidae, Thyrididae, Zygaenoidea, Lasiocampidae, Cossoidea, Scythrididae and Psychidae in Africa than in North America north of Mexico. Some of these differences may reflect underlying temperate versus tropical factors rather than biogeographical differences between the continents per se.

Conclusions

We posit that inventories of diverse lepidopteran communities can serve as both bioindicators of environmental changes over time and proxies of differences across geographic scales of the broader flora and fauna. Lepidopteran species are restricted by their larval host specificity, typically, to a limited number of plant, lichen, or fungal taxa. As such, we expect that a site's resident lepidopteran species will reflect its flora and differ with other sites in response to changes across their host communities. Because moths are attracted to lights, they are easy to inventory rapidly and safely (Pickering & Staples 2016). They do not require the considerable effort needed in bashing around the bush, finding primates, plants, birds, butterflies and other groups typically used to classify and compare biota. Because of the paucity of information about the composition of the biota of many African parks and conservation areas, we call for the *African Moth Inventory* as a first approximation to fill in gaps in our knowledge.

In 2017 Discover Life plans to study moths across more sites in the Americas and refine our standardized sampling methods to document and compare communities. We are recruiting museums, websites, other organizations, and individual participants to provide expertise and data for the *African Moth Inventory*, help inventory sites, and determine specimens. We plan to start photographing synoptic specimens of moths in the Natural History Museum of Zimbabwe and building identification guides for Africa. We will make all images, guides and associated data freely available online to everyone.

We encourage SLS members to help. We will host two organizational and training meetings in 2016: 30 October in Gainesville, Florida, at the end of the SLS meeting; and 9-11 December in Athens, Georgia, when Discover Life will celebrate 4 billion hits and plan for the future. For details go to Discover Life's *Events* page. Please, join us!

References

Ackery, P.R., CR Smith and R Vane-Wright (eds.), 1995. Carcasson's *African Butterflies. An Annotated Catalogue of the Papilionoidea and Hesperioidea of the Afrotropical Region.* CSIRO Publishing. pp. 816.

Larsen, T.B., 2005. *Butterflies of West Africa.* Text volume. Apollo Books, Stenstrup, Denmark. pp. 595.

Pickering, J., 2010. Identification guide and illustrated checklist of the moths of North America north of Mexico. Discover Life electronic publication (discoverlife.org/mp/20q?guide=Moth) [accessed 9 September, 2016].

Pickering, J., 2015. Find your dark side: Invitation to join Discover Life's *Mothing* project. *S. Lep. News* 37(4):205-208.

Pickering, J., 2016. Why fly now? Pupa banks, aposematism, and other factors that may explain observed moth flight activity. *S. Lep. News* 38(1): 67-72.

Pickering, J. and T. Staples, 2016. How to sample moth diversity efficiently in a seasonal environment. *S. Lep. News* 38(2): 142-147.

Poole, R.W. and P. Gentili (eds.), 1996-1997. Nomina Insecta Nearctica. A Checklist of the Insects of North America. Volume 3: Diptera, Lepidoptera, Siphonaptera. Entomological Information Services, Washington, D.C. (see www.nearctica.com/nomina/main.htm)

Pringle, E.L.L, G.A. Pringle and J.B. Ball (eds.), 1994. *Pennington's Butterflies of Southern Africa (2nd edition).* Struik Publishing Group, Cape Town, South Africa. pp. 800.

De Prins, J. and W. De Prins, 2016. Afromoths, online database of Afrotropical moth species (Lepidoptera). World Wide Web electronic publication (www.afromoths.net) [accessed 13-16 August, 2016].

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

Vári L., 1961. South African Lepidoptera. I. Lithocolletidae. Transvaal Museum Memoir 12:1–238, pls. 1–112.

Williams, M.C., 2007. Afrotropical butterflies and skippers: a digital encyclopedia. atbutterflies.com

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