Volume 57, Number 2 Summer 2015

NEWS OF THE LEPIDOPTERISTS' SOCIETY

www.lepsoc.org

Inside:

The true host of the Golden-banded Skipper

The Ralph L. Chermock collection -- treasures include lost holotypes

The international initiative on the Monarch Butterfly

Some Ghost Moths of NSW, Australia

The Sleepy Orange now in Hawaii

Dominican Pyraloidea for the Texas A&M tropical biology program

Membership Updates,
Marketplace,
First Encounters,
Metamorphosis,
Announcements ...

... and more!

NEWS OF THE LEPIDOPTERISTS' SOCIETY

Volume 57, Number 2
Summer 2015

The **News of The Lepidopterists' Society** (ISSN 0091-1348) is published quarterly by The Lepidopterists' Society, c/o Chris Grinter, Illinois Natural History Survey, 1816 South Oak St. Champaign, IL 61820-0904, and includes one or two supplements each year. The **Season Summary** is published every year as Supplement S1 and is mailed with issue 1 of the News. In even numbered years a complete **Membership Directory** is published as Supplement S2 and is mailed with issue 4 of that volume of the News. Please see the inside back cover for instructions regarding subscriptions, submissions to, and deadline dates for, the News.

Periodicals Postage paid at Champaign, IL, and at additional mailing office (Lawrence, KS).

POSTMASTER: Please send address changes to **News of The Lepidopterists' Society,** c/o Chris Grinter, Illinois Natural History Survey, 1816 South Oak St., Champaign, IL 61820-0904.

www.lepsoc.org

Contents

An aberrant form of Weidemeyer's Admiral (*Limenitis weidemeyerii*: Nymphalidae) discovered in Utah, U.S.A.
Jade Aster T. Badon. 55
A case of mistaken identity: the true host of the Golden-banded Skipper *Autochton cellus* (Hesperiidae: Eudaminae) in the U.S.
Richard W. Boscoe, Marc C. Minno, and David M. Wright. 56
Some Ghost Moths (Hepialidae) of New South Wales, Australia
David Fischer. 60
Evaluation of the insecticide Deltamethrin to control the Cocoa Pod Borer *Carmenta foraseminis* Eichlin in Colombia, S.A.
Gabriel Cubillos. 63
Notes regarding three similar *Synanthedon* species (Sessiidae)
William H. Taft and Gary Anweiler. 66
Announcements: 68
64th Annual Meeting of the Lep Soc; Maine, July 12-18; Sixth Annual Lep Course, Aug. 16-25; Zone Coordinators Needed; Colorado Digital Libraries pubs; Pay Pal; Society of Kentucky Leps; National Moth Week; Corrections; Brochures
First Encounters: My first encounter with a Monarch
Greg Pohl. 70
Membership Updates
Chris Grinter. 71
The Sleepy Orange transits the Pacific: a new butterfly species for Hawaii
Daniel Rubinoff, Janis Matsunaga, Forest Starr, Kim Starr, and William Haines. 72
Dominican Pyraloidea for the tropical and field biology program at Texas A&M
Alma Solis. 74
Tent building by larval *Anaea troglodyta floridalis* (Nymphalidae)
Mark Salvato, Holly Salvato and Jimi Sadle. 77
The Marketplace. 78
Long-lost holotypes and other forgotten treasures in the Ralph L. Chermock collection, with biographical notes
John V. Calhoun. 80
Do subspecies exist?
James Scott. 86
Park City, Utah 63rd Lep Soc Meeting -- Butterfly field trips
Ranger Steve Mueller. 89
Conservation Matters: The imperiled Mardon Skipper Butterfly: an initial conservation success
Scott H. Black. 92
Metamorphosis. 95
Dr. Bob's Arboreal Adventure, by *James Scott* 97
Membership Information, Dues Rates, Journal of the Lepidopterists' Society, Change of Address, Our Mailing List, Missed or Defective Issues, Submission Guidelines and Deadlines for the News. 98
Executive Council/Season Summary Zone Coordinators. 99

Issue Date: May 26, 2015

ISSN 0091-1348
Editor: James K. Adams

Front Cover:

Bossard's Hawk Moth (*Manduca lefeburii bossardi*), El Salto Falls, 12 km N of El Naranjo, San Luis Potosí, Mexico, Dec. 1987. (photo by James K. Adams)

An aberrant form of Weidemeyer's Admiral (*Limenitis weidemeyerii*: Nymphalidae) discovered in Utah, U.S.A.

Jade Aster T. Badon

McGuire Center for Lepidoptera and Biodiversity, Florida Museum of Natural History, University of Florida, Gainesville, FL 32611 **jaabadon@gmail.com**

Key words: Butterflies, North America, Utah, Nymphalidae, *Limenitis*

The Weidemeyer's Admiral, *Limenitis weidemeyerii* W.H. Edwards (1861), is a North American butterfly species distributed through the Rocky Mountain States. It also ranges east to Nebraska, west and south to central California, Arizona, and New Mexico, and north to the southern borders of Alberta, Canada.

An extraordinary male aberrant form of *L. weidemeyerii* was collected on Bountiful Peak, Davis County, Utah on July 16, 2014. The peak's highest elevation is 9,200 feet.

Fig. 1. An aberrant male specimen of *Limenitis weidemeyerii* from Bountiful Peak, Davis County, UT. Top: dorsal, Bottom: ventral.

It was Dr. Andrew Warren who first noticed the aberrant specimen in my collection box following the July 2014 Lepidopterists' Society Meeting held at Park City, Utah. This is the first time this aberration off this species has been recorded. The white pattern is dusted with melanic scaling, almost eliminating the hindwing bands (Fig. 1).

Some of the other butterfly species on the peak were Indra Swallowtails (*Papilio indra indra*), which were flying near the ridge. Other species such as *Speyeria* spp. were also abundant in the area, as well as the dayflying moth species of the genus *Hemileuca*.

Fig. 2 and 3. The habitat and high-elevation vegetation of Bountiful Peak, mid July 2014, where the aberrant male specimen of *L. weidemeyerii* was collected.

www.lepsoc.org and https://www.facebook.com/lepsoc

A case of mistaken identity: the true host of the Golden-banded Skipper Autochton cellus (Hesperiidae: Eudaminae) in the eastern U.S.

Richard W. Boscoe[1], Marc C. Minno[2] and David M. Wright[3]

[1]150 Ridge Pike, Apt. 101, Lafayette Hill, PA 19446
[2]600 NW 35th Terrace, Gainesville, FL 32607 **marc.minno@gmail.com**
[3]100 Medical Campus Drive, Lansdale, PA 19446 **dmwright@ahlansdale.org**

Austin H. Clark (1936) published what has been the definitive and authoritative account of the life history of the Golden-banded Skipper *Autochton cellus* (Boisduval & Le Conte, [1837]) in the eastern United States. In his paper Clark identified the larval host as the leguminous vine *Falcata pitcheri* (Torr. & A. Gray) Kuntze, a synonym of *Amphicarpaea bracteata* (L.) Fernald, commonly known as Hog Peanut. Subsequent treatments in various butterfly guides and manuals, such as Klots (1951), Harris (1972), Opler & Krizek (1984), Scott (1986), Allen (1997), and Brock & Kaufman (2003), have followed Clark (1936). Allen *et al.* (2005) illustrated the larva and listed the hosts as Hog Peanut, Butterfly Pea, Wild Beans, and other legumes. Burns (1984) reviewed the temporal and spatial distributions; variations in size, facies, and genitalia; and the larval food plants of *A. cellus* in the United States, Mexico, and Central America. He identified two isolates or differentiates, one in eastern U.S. and the other ranging from southwestern U.S. into Central America, evincing a preference for hilly or mountainous country throughout its range. He listed the known larval hosts as Leguminosae in several genera: *Amphicarpaea*, *Clitoria*, *Phaseolus*, and *Vigna*. He also reported the collection and rearing of larvae on *Phaseolus wrightii* A. Gray in the Big Bend region of Texas and on *Phaseolus grayanus* Woot. & Standtl. in Cochise County, Arizona. Minno and Friedman (2012) observed the host of *A. cellus* at Florida Caverns State Park in the Florida panhandle to be Thicket Bean (*Phaseolus polystachios* (L.) Britton, Sterns & Poggenb.), another twining legume which resembles Hog Peanut *A. bracteata*.

The senior author with the help of Thomas J. Allen was able to locate a population of *A. cellus* in Fork Creek WMA, near Nellis, Boone County, West Virginia, where from years 2000 to 2010 multiple attempts were made to rear *A. cellus* on Hog Peanut from confined females without success. Most females died without oviposition. Although no eggs were deposited on the foliage, small numbers of eggs were occasionally placed on the sides of the cage or the plastic bag in which females were confined. Following hatching, neonate *A. cellus* larvae refused to eat or to construct leaf shelters on *A. bracteata*. Even if placed directly on *A. bracteata* plants, they wandered off and starved. Also of particular interest at the Fork Creek site, many *Epargyreus clarus* females were observed ovipositing on *A. bracteata*. *Epargyreus clarus* larvae were easily found on the leaves of this vine. However, no *A. cellus* females were observed ovipositing on *A. bracteata* and no *A. cellus* larvae were ever found on it. Clark (1936) reported *E. clarus* larvae on what he called the Small-leaved Hog Peanut, *Falcata comosa*, but not on *Falcata pitcheri*. Today *Falcata comosa* (L.) Kuntze is a recognized variety of Hog Peanut *Amphicarpaea bracteata*, while Clark's reference to *Falcata pitcheri* is a misidentification of *Phaseolus polystachios*.

Because of a coal mining operation, Fork Creek WMA was no longer accessible after 2010. The senior author, again with directions provided by T. J. Allen, located an additional *A. cellus* population in the vicinity of Cabin Creek, Kanawha County, West Virginia. This site was first visited on June 7, 2011. Adult males were observed perched along a trail adjacent to a creek leading into a steep shaded hollow, typical *A. cellus* habitat in southern West Virginia (Allen, 1997). Eventually, on higher ground, plants were found resembling *A. bracteata*, but with larger, coarser leaflets and with ventral surfaces overspread by curved hairs which cause them to stick together when apposed, unlike *A. bracteata* which has smooth non-sticky ventral leaf surfaces. The plants, later identified as *Phaseolus polystachios*, commonly known as Thicket Bean or Wild bean, were not flowering at this time. The pink flowers have a distinctive twisted keel petal illustrated in Minno & Friedman (2012).

Many of these plants contained leaf shelters (Fig. 12) on the dorsal leaf surface margins, characteristic of *A. cellus* shelters as described and illustrated by Clark (1936). Upon turning over the infested leaflets, small clusters of hatched eggs were observed on the ventral leaf surfaces. Subsequent visits were made on June 27 and August 8 & 29 in 2011; on June 4 & 16, July 16, and August 13 in 2012; on June 3 & 29 and August 13 in 2013; and on August 16 in 2014. Adults, eggs, and larvae were seen in June and again in early to mid August, females were observed ovipositing on *P. polystachios*, always on the ventral leaf surfaces. In July and late August only larvae were found. Samples of larvae were collected and reared to adults, with most pupae entering diapause and overwintering until the following spring. It is evident that there are two broods in southern West Virginia, contrary to Allen (1997). The first brood appears to be more numerous, consistent with Clark's (1936) findings for the population which he studied in the vicinity of Great Falls, Montgomery County, Maryland.

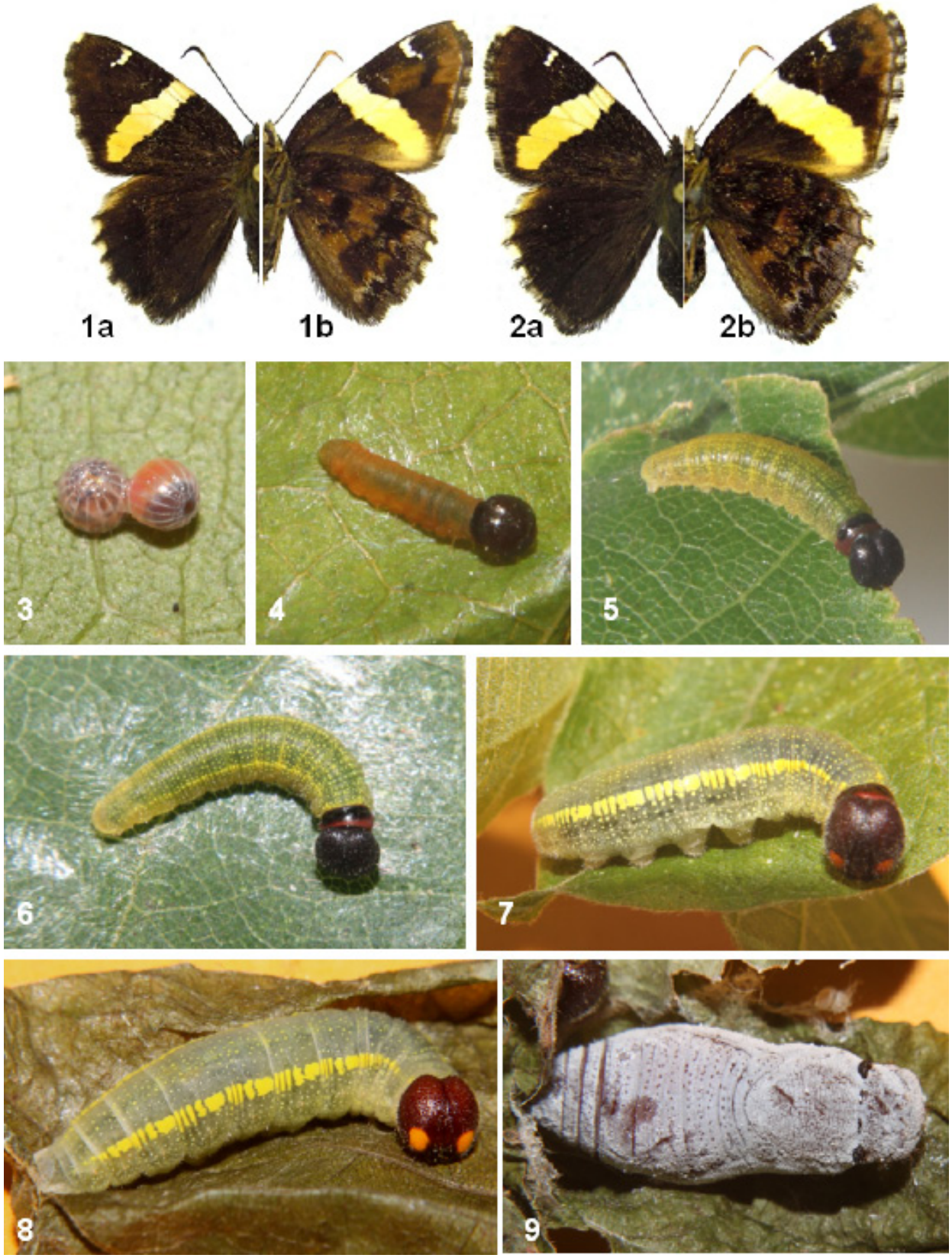


Fig. 1 a. (dorsal) & b. (ventral). *Autochton cellus*. Male *ex* larva coll. 29 Jun 2013, vic. Cabin Creek, Kanawha Co., WV, on *Phaseolus polystachios*, emerged 19 April 2014; Fig. 2 a. (dorsal) & b. (ventral). *Autochton cellus*. Female *ex* larva coll. 11 August 2013, same location, emerged 25 April 2014; Fig. 3. Eggs; Fig. 4. First instar; Fig. 5. Second instar; Fig. 6. Third instar; Fig. 7. Fourth instar; Fig. 8. Fifth instar; Fig. 9. Pupa.

Although *A. bracteata* grows commonly in the Cabin Creek habitat, no *A. cellus* ovipositions were observed on it and no larvae were found on it. Larvae of *E. clarus* were found on *A. bracteata*, *Apios americana* Medik., and *Robinia pseudoacacia* L., but not on *P. polystachios*. *E. clarus* females passed over *P. polystachios* where it was seen growing in close proximity to saplings of *R. pseudoacacia*. Clark (1936) noted that the plants on which he found *A. cellus* larvae had leaves which were rough on their ventral surfaces bearing many curved hairs. He also observed that many females appeared to have frayed hind wing margins, suggesting that they were ovipositing on a rough surface.

The life history of *A. cellus* as described in Clark (1936) is confirmed in this study. Our rearing results are described as follows. **Eggs** (Fig. 3)**:** 1 mm width, globular with flat base, vertical ribs, and shallow micropylar region at top. Eggs turn red and then darken before hatching. **First instar** (Fig. 4)**:** 2 mm length, body light orange, head black, prothoracic shield black. Rests in leaf shelters. **Second instar** (Fig. 5)**:** 8 mm length, body green with faint yellow dots, head black with slightly rugose surface, prothoracic shield black, remainder of prothorax red. Rests in leaf shelters. **Third instar** (Fig. 6)**:** 8-12 mm length, body green with yellow dots and thin yellow dorsolateral line, head black with rugose surface, prothoracic shield black, remainder of prothorax red. Rests in leaf shelters. **Fourth instar** (Fig. 7)**:** 12-22 mm length, body green with yellow dots and bold yellow dorsolateral line, head reddish brown with rugose surface and orange bilateral spots adjacent to frons, prothoracic shield reddish brown, remainder of prothorax red. Feeds nocturnally and rests in leaf shelters (Fig. 12). **Fifth instar** (Fig. 8)**:** 24-35 mm length, body green with yellow dots and bold yellow dorsolateral line, somewhat flattened head reddish brown with rugose surface and orange bilateral spots adjacent to frons, prothoracic shield reddish brown, remainder of prothorax red. Feeds nocturnally and rests in leaf shelters. **Pupa** (Fig. 9)**:** 17-28 mm, dark brown and covered with flocculent light gray wax, cremaster with stout hooks. Pupates in leaf litter. Diapause occurs in the pupal stage.

The genus *Phaseolus* includes several species of beans historically cultivated in Mexico and the central Andes. Due to its economic significance, the genus has been a focus of recent molecular and systematic research (Delgado-Salinas *et al.*, 2006). These authors recognize 70 *Phaseolus* species with a center of diversity distributed mainly in Mexico, but also in southern Arizona, southern New Mexico, and western Texas south to northern Panama. Thicket Bean (*P. polystachios*) is the single native species in the eastern United States (Fig.13). This bean is a twining vine with stems extending up to two meters in length. The leaves are compound with two or more (usually three) leaflets (Fig. 11 a), which are very similar to the leaves of Hog Peanut (*A. bracteata*) (Fig. 10 a). All leaves of Thicket Bean are deep green in color and coarsely pubescent below featuring a blanket of hooked uncinate hairs (Fig. 11 b), which are lacking on the undersurfaces of Hog Peanut leaves (Fig. 10 b). An easy method to distinguish Thicket Bean from Hog Peanut in the field is to crease a leaflet in half and fold the opposing undersides together. The two halves of the Thicket Bean leaflet will remain attached (Velcro® like effect), while those of Hog Peanut will immediately unfold.

In the original description of *Eudamus cellus* by Boisduval & Le Conte (1837), the skipper appeared on Plate 73, copied from a John Abbot drawing. This plate illustrated the adult, larva, pupa, and putative host. The larva is figured on a plant that Abbot called *Convolulus*, which is an unlikely *cellus* host. The plant has been subsequently identified as Water Dawnflower (*Stylisma aquatica*) (Convolvulaceae). Calhoun (2007) pointed out that Abbot's depiction of this purported host is either an aesthetic substitution or a misidentified plant gathered for his composition. Another possibility is that mature *A. cellus* larvae will, on occasion, nest in leaves of a plant on which they are not feeding when that plant is growing in intimate association with Thicket Bean (RWB, pers. ob.).

Literature Cited

Allen, T. J. 1997. The Butterflies of West Virginia and Their Caterpillars. University of Pittsburgh Press, Pittsburgh. 388 pp.

Allen, T. J., J. P. Brock & J. Glassberg. 2005. Caterpillars in the Field and Garden A Field Guide to the Butterfly Caterpillars of North America. Oxford University Press, New York. 232 pp.

Boisduval, J. B. A. D. de & J. E. Le Conte. 1829–[1837]. *Histoire générale et iconographie des Lépidoptères et des chenilles de l'Amérique septentrionale. Librairie Encyclopédique de Roret, Paris.* 228 pp., 78 pl.

Brock, J. P. & K. Kaufman. 2003. Butterflies of North America. Houghton Mifflin, New York. 384 pp.

Burns, J. M. 1984. Evolutionary differentiation: differentiating gold-banded skippers – *Autochton cellus* and more. Lepidoptera.: Hesperiidae: Pyrginae. Smithsonian Contributions to Zoology 405:1-38.

Calhoun, J. V. 2007. The butterfly drawings by John Abbot in the Hargett Rare Book and Manuscript Library, University of Georgia. Journal Lepidopterists' Society 61(3): 125-137.

Clark, A. H. 1936. The gold-banded skipper (*Rhabdoides cellus*). Smithsonian Miscellaneous Collections 95(7):1-50.

Delgado-Salinas, A., R. Bibler, & M. Lavin. 2006. Phylogeny of the genus *Phaseolus* (Leguminosae): A recent diversification in an ancient landscape. Systematic Botany 31(4):779-791.

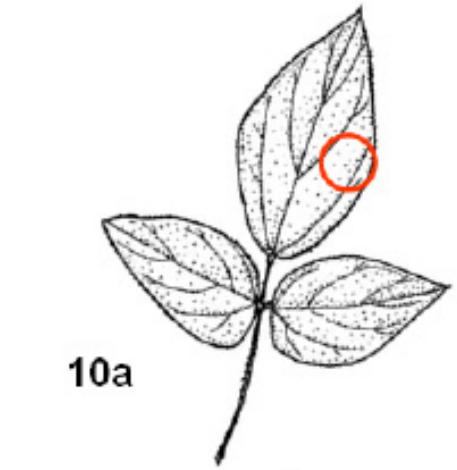
Harris, L. 1972. Butterflies of Georgia. University of Oklahoma Press, Norman. 326 pp.

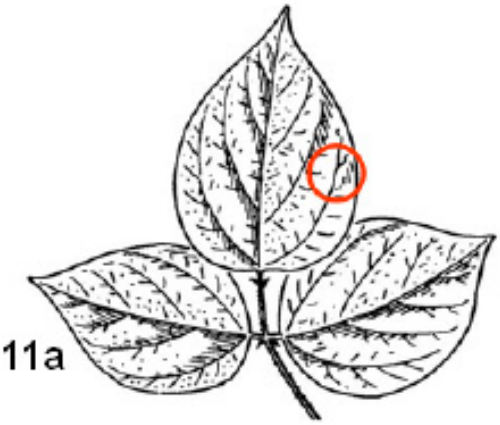
Kartesz, J. T. 2013. The Biota of North America Program (BONAP). North American Plant Atlas. [**http://bonap.net/NAPA/TaxonMaps/Genus/County/Phaseolus**]

Klots, A. B. 1951. A Field Guide to the Butterflies of North America, East of the Great Plains. Houghton Mifflin, Boston. 349 pp.

Minno, M. C. & M. A. Friedman. 2012. A new larval host plant for the golden-banded skipper (*Autochton cellus*: Hesperiidae: Eudaminae) in Florida. News of the Lepidopterists' Society 54(1):3-5.

Opler, P. A. & G. O. Krizek. 1984. Butterflies East of the Great Plains. The Johns Hopkins University Press, Baltimore, 294 pp.





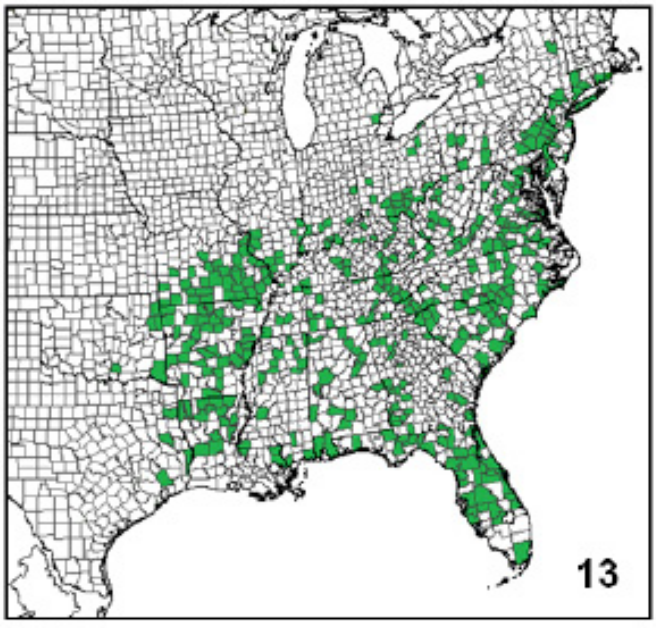


Fig. 10. Hog Peanut. *Amphicarpaea bracteata*. (a) Leaf contour adapted from Rhoads & Block (2000). Circle indicates area of enlargement. (b) Close-up of ventral leaf surface showing nearly smooth surface with fine hairs on veins; Fig. 11. Thicket Bean. *Phaseolus polystachios*. (a) Leaf contour adapted from Strasbaugh & Core (1978). (b) Close-up of ventral leaf surface showing network of coarse hairs with terminal hooklets; Fig. 12. Larval nest of *Autochton cellus* (4th instar) on *Phaseolus polystachios*; Fig. 13. County distribution map of *Phaseolus polystachios* in eastern U.S. adapted from Kartesz (2013)

Rhoads, A. F. & T. A. Block. 2000. The Plants of Pennsylvania: An Illustrated Manual. University of Pennsylvania Press, Philadelphia. 1061 pp.

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

Strausbaugh, P. D., & E. L. Core. 1978. Flora of West Virginia. 2nd ed. Seneca Books, Inc., Morgantown. 1079 pp.

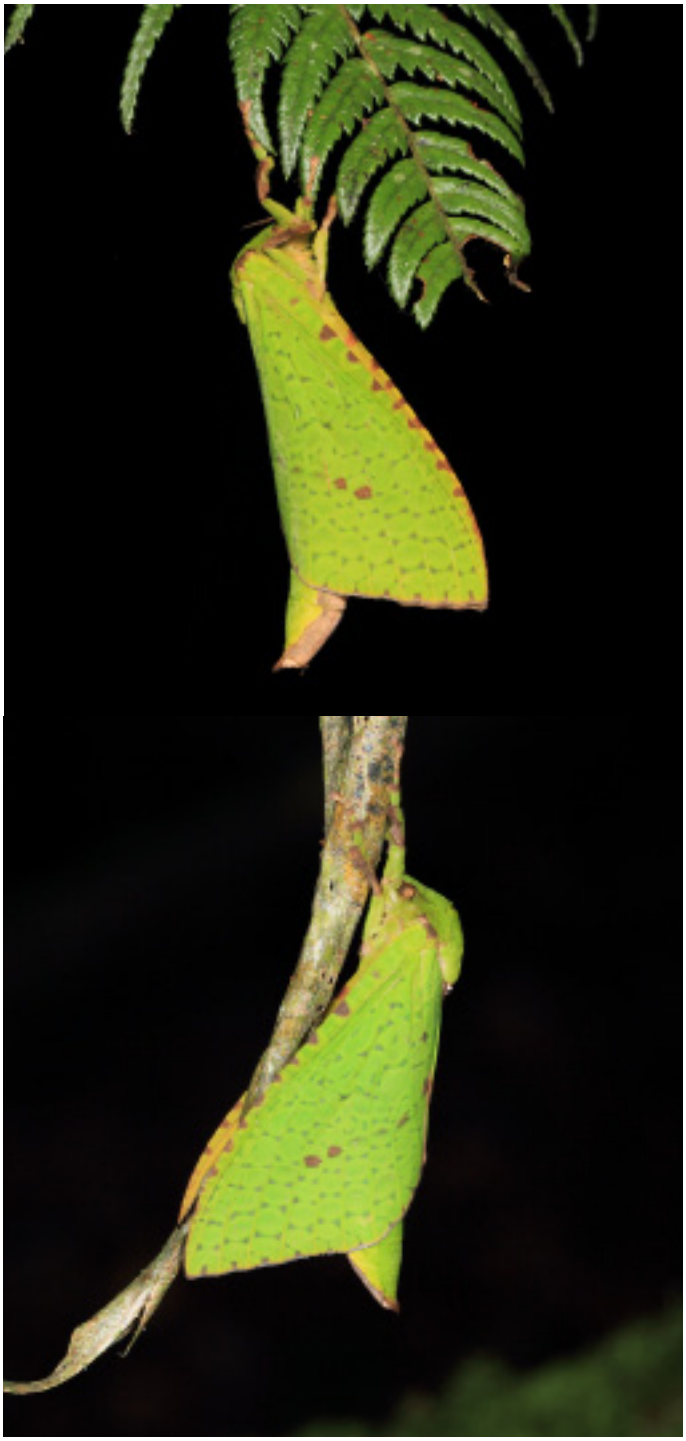
Some Ghost Moths (Hepialidae) of New South Wales (NSW), Australia

David Fischer

12 Byarong Ave, Mangerton, NSW 2500, Australia **dfische5@csc.com.au**

For those of you who follow some Lepidoptera related groups on Facebook, you may have seen some of the lovely images posted there by David Fischer. For those of you who do not, I (James Adams, the editor) thought it would be great if I could get David to share some of his images. Enjoy these images of some species in one of the coolest moth families, especially in Australia. Hopefully, I'll be able to get David to contribute some more. Thanks, David!!

Elhamma spp.; the bottom specimen is likely *E. australasiae*, Wollongong, NSW. Mar 2015.



Aenetus scotti, montane rainforest in the Border Ranges National Park, NSW Oct 2014.


Abantiades labyrinthicus, Brindabella Ranges, NSW. Feb 2015.

Abantiades labyrinthicus, Brindabella Ranges, NSW. Feb 2015.

Abantiades magnificus, Brindabella Ranges, NSW. Feb 2015.


Abantiades sp. (maybe *trictena*) Atherton Tablelands, Queensland Feb 2015.

Abantiades hyalinatus, Carrington Falls, NSW Feb 2015.

Abantiades hyalinatus, Dharawal National Park, NSW, Feb 2015.

Abantiades hyalinatus, Brindabella Ranges, NSW, Feb 2015, Eucalyptus Wattle forest.

Evaluation of the insecticide Deltamethrin to control the Cocoa Pod Borer, *Carmenta foraseminis* (Busck) Eichlin in Colombia, S.A.

Gabriel Cubillos

Carrea 86 #34-56, Medellín (Antioquia), Colombia S.A. **cubillos.g@gmail.com**

ABSTRACT

The "Cocoa Pod Borer", *Carmenta foraseminis* (Lepidoptera: Sesiidae), is a pest of cocoa in the Southwestern Department of Antioquia, Colombia, S.A., that causes annual production losses of 30%. To assess the action of the insecticide Deltamethrin in reducing the damage caused by this insect, a commercial trial was conducted in the cocoa plantation of "Granja Agrícola La Nacional", located in Támesis municipality, Antioquia department (Colombia S. A.). This area is at 1040 meters above sea level, with a mean annual temperature of 23° C, 2,400 millimeters of rain, and 76% relative humidity. Between September 20 and November 28 of 2011, Deltamethrin was applied 6 times at 2 week intervals, at a concentration of 25 parts per million. 40 days after the first application of insecticide, incidence of damage and loss data were recorded for comparison with historical records of the same periods prior to use the insecticide. In November-December of 2011, the incidence and harvest losses were 5.9% and 5.8% respectively compared to averages of 52.6% and 37.8% for the same period in the previous three years without applications. The insecticide appears to have had a lethal effect on the insect adults, significantly affecting their population and therefore substantially diminishing the damage and harvests losses. Based on these results, the insecticide Deltamethrin can be considered an effective aid in the management of the "Cocoa Pod Borer".

Keywords: *Carmenta foraseminis*, Cocoa Pod Borer, insecticide Deltamethrin.

Figure 1. Adult female of Cocoa Pod Borer

Figure 2. Main damage of the "Cocoa Pod Borer" occasioning decomposition of the seed pulp generating off-flavor of the commercial product.

Problem statement and justification

The "Cocoa Pod Borer," is a clear-winged moth (Figure 1) whose larva develops inside the cocoa fruit. When it emerges, the adult drills an exit hole in the rind, allowing moisture and secondary biological agents in allowing some decomposition of the mucilage that cover the seeds and tainting the fruit, seriously affecting the commercial value (Figure 2).

The "Pod Borer" is clearly established in the west and southwest parts of Antioquia department by Leal and Hernandez (1990). Recently, Delgado (2007) reported its presence in the municipalities of Salazar, Arboleda, Cucutilla, El Zulia, Sardinata, Cúcuta and Bucarasica in the department of Norte de Santander. However, the only assessment done of crop losses from this cause was from Granja Agrícola La Nacional, in the municipality of Támesis (Antioquia department), where over a period of 13 months (November / 07 December / 08) the losses were 27.4% of the total product.

Aware of the risk that this pest represents and the fear of its spread into eastern Colombia, an area that contributes 40% to the national production, finding effective measures to control the borer that are also easily accessible to the farmer would seem a priority.

Theoretical Framework

Until now the information on the control of "Pod Borer" is mainly from the work done by Navarro and Shack (2006) from Venezuela. They suggest and recommend that the release of the wasp *Trichogramma pretiosum* decreases significantly the damage caused by this insect. However, these authors provide no experimental evidence to substantiate their claims.

In Colombia, there have been no trials done on controling the "Pod Borer" by chemical means. However, Mumford and Ho (1988), and Rosmana et al. (2010) in Southeast Asia (Indonesia, Malaysia, Philippines and Papua New Guinea, among others) confirm the effectiveness of applying insecticides, especially of the pyrethroid group, to reduce the Cocoa Pod Borer, *Conopomorpha cramerella*, (Gracillariidae) infestations. Potential side effects are not known, however.

Rosmana (pers. comm.) suggests spraying Pyrethroid insecticides directly on the fruits at the time of harvest to prevent insect damage during the "peak" harvest. Additionally, he also recommended spraying tree branches of the bottom canopy as a complementary measure.

Following these suggestions, the present study evaluates the insecticide Pyrethroid Deltamethrin 25 ppm (trade name, Decis 2.5%) for their effectiveness to reduce the production losses of "Cocoa Pod Borer".

Objectives

General: Testing the effectiveness of the insecticide Deltamethrin in controlling the "Cocoa Pod Borer", *Carmenta foraseminis*.

Specifics: 1. Breaking the life cycle of the "Pod Borer" by killing the adults of the insect; 2. Compare damage levels of "Pod Borer" before and after application of the insecticide.

Materials and methods

Fieldwork was conducted in the cocoa plantations of the farm Granja Agricola La Nacional, owned by the Compañía Nacional de Chocolates. As indicated, this farm is in Támesis, department of Antioquia, Colombia, S.A. This area is at 1040 meters above sea level, with a mean annual temperature of 23° C, 2,400 millimeters of rain, and 76% relative humidity. The plantation has approx. 4,000 cloned cocoa trees more than 10 years old.

The Insecticide was applied under the trademark Decis, with a dosage of 2.5% per 1 mililiter per liter of water (25 ppm of Deltamethrin). Additionally, the mixture included 1.5 mililiters of Potenzol per liter of water. A manual pump was used to spray mixture exclusively on to the fruits at between 4 and 5 months of age (Figure 3). 6 applications were made at intervals of two weeks between September 20 and November 28, 2011.

Figure 3. Spraying insecticide Deltamethrin on the cocoa fruits.

For the harvest, we recorded percentages of healthy fruit, with "Pod Borer", and affected by the diseases "Black Spot" (*Phytophthora* spp.) and "Monilia" (*Moniliophthora roreri*). These data were compared with harvest recrords for 2008 through 2010 (Table 1), prior to application of the insecticide.

To appropriately apply the insecticide at a time that would be most effective, it was essential to know the life cycle of the insect. Under laboratory conditions, Leal and Hernandez (1990) found that the egg-larval period for the "Pod Borer" is 41 days. A few days before the formation of the pupa, damage begins to be evident on the fruit. As such the symptoms of fruit damage are evident at about day 40 after initial egg laying (infestation). Subsequently, that means that the potential effectiveness of the Deltamethrin will only be evident 40+ days after application, and only by examining fruits for damage, or absence thereof.

Results

Incidence and losses

As the applications of the insecticide Deltamethrin covered the total area of the cocoa crop, the only way to test its effectiveness would be comparing incidence (infestation) levels and losses 40+ days after application versus these same indices for equivalent periods of the previous three years (2008-2010) without insecticide.

Table 1. Harvest data and % incidence/loss during November-December period from 2008-2011.

HARVEST INTERVALS	HEALTHY PODS		PODS WITH BORER		BLACK POD		MONILIA POD		TOTAL PODS			%	%
	Number	kg wet	Number	kg wet	Number	kg wet	Number	kg wet	Number	kg wet	kg dried	INCIDENCE	LOSSES
Nov.-Dec /08	1295	136	2043	14	135	6	30	0	3503	156	50	58.3	54.5
Nov.-Dec /09	1182	118	1794	62	0	0	0	0	2976	180	58	60.3	39.4
Nov.-Dec /10	12227	1384	10192	581	3650	266	27	0	26096	2231	630	39.1	19.4
AVERAGE	4901.3	546	4676.3	219	1261.7	90.7	19.0	0	10858	856	246	52.6	37.8
Nov.-Dec /11	15830	1766	1177	4	2638	80	108	0	19823	1850	575	5.9	5.8

Production records of the last two months of the years 2008 – 2011 (Table 1) permit comparison of incidence and loss before and after the insecticide applications.

The levels of incidence and losses in the two months from November to December 2011, with application of Deltamethrin, are 5.9% and 5.8% respectively. For the same period from 2008-2010, the levels of incidence and losses averaged 52.6% and 37.8% respectively.

In Figure 4 we can see the health status of the last harvest of December 2011. After going through an inspection/ separation process, the percentages of fruits removed from the actual harvested fruits registered incidence and losses of 2.9% and 2.3% respectively.

Figure 4. This mound of fruits shows the health status of the last harvest of December 2011.

Discussion and conclusions

The results show that the insecticide Deltamethrin applied at the time of harvest and spraying exclusively the 4-5 month-old fruits exerted a protective action on the fruits harvested in the peak season for the period from November to December of 2011.

Apparently the insecticide acted lethally on the existing adult population within the cocoa crop. As such, further infestations were apparently largely prevented. As a result, levels of damage to the main crop ending the year were greatly diminished.

The adult insect is nocturnal for the most part (pers. obs.) and remains at rest for several hours, often on the fruit. These habits allows to the insecticide to act more easily on the adults, both by contact and by inhalation.

Deltamethrin appears to be significantly effective in controlling the "Cocoa Pod Borer", *Carmenta foraseminis*. I would suggest that it is a promising formula to mitigate the losses of the cocoa harvests.

Acknowlegements

The author is grateful to all those who in one way or another participated in the study, especially the Compañía Nacional de Chocolates (now Nutresa SAS Group) who helped with financing. and with access to the facilities and staff.

References

Leal, C. C. and Hernandez, M. L. 1990. Aspects borer bionomic the cocoa pod *Synanthedon theobromae* (Busck) (Lepidoptera: Sesiidae). Thesis. Medellín: National University of Colombia, Faculty of Agricultural Sciences, 1990.

Delgado, Daisy Zamira. 2007. Bioecology fruit borers cocoa (*Theobroma cacao* L.) in the municipalities of Woodlands, Cucuta and Zulia Norte de Santander department. Cucuta: Universidad Francisco de Paula Santander. Faculty of Agricultural and Environmental Engineering Agricultural Production. 2007.

R. Navarro and W. Shack. 2006. Borers control the cocoa pod in central Venezuela. Discloses INIA. 7: 19-26.

Mumford, J. D. and S. H. Ho. 1988. Control of cocoa pod borer (*Conopomorpha cramerella*). Cocoa Grower's Bulletin. 40: 19-29.

Rosmana A., M. Shepard, P. Hebbar, and A Mustari. 2010. Control of cocoa pod borer and Phytophthora pod rot pod using degradable plastic sleeves and a nematode, *Steinernema carpocapsae*. Indonesian Journal of Agriculture Science. 2010: 11: 41-47.

www.lepsoc.org and
https://www.facebook.com/lepsoc

Notes regarding three similar appearing *Synanthedon* species (Sesiidae)

William H. Taft, Jr.[1] and Gary Anweiler[2]

[1]Research Contributor, A. J. Cook Research, Michigan State University, 1430 W. Locher Road DeWitt, MI, 48820
billandgussie@earthlink.net
[2]University of Alberta, E.H. Strickland Entomological Museum, Dept. Biol. Sci., Edmonton AB, T6H 3S5
gganweiler@shaw.ca

In a continuing effort to assist in the identification of superficially similar species of sesiids, one of us (Taft) has routinely put together PowerPoint slides that illustrate important diagnostic characters for separating these species, which we believe may be of use to others.

Several species of the genus *Synanthedon* can be difficult to identify, in particular *Synanthedon pyri* (Apple Bark Borer), *Synanthedon scitula* (Dogwood Borer) and to a lesser extent *Synanthedon helenis*. In MONA Fascicle 5.1 the late Dr. T. Eichlin stated that the range of *S. pyri* is more restricted than reported by Engelhardt (1946), and misidentification of *S. scitula* as *S. pyri* resulted in host plant discrepancies. Eichlin also noted that adult sesiids may change in appearance due to scale loss as they age, including some of the diagnostic characters (Figures 1-3). Additionally, *S. scitula*, which historically has had an eastern North American distribution, has recently been found in new areas of the United States, in particular in the Pacific Northwest (Looney, et al., 2012). The larvae of *S. scitula* are borers in a wide variety of woody trees and shrubs, including apple (*Malus* sp.) and blueberry (*Vaccinium* sp.), and likely has the potential to become a pest.

The range of *Synanthedon helenis* was originally described as "Saskatchewan", but recent collections have revealed a much broader range including Alberta, Ontario, and southern Michigan.

Depending on condition when captured, separating adults of *S. scitula*, *pyri* and *helenis* can be challenging. *S. helenis* specimens from western Canada have much less orange scaling on the forewing distal spot than specimens collected in Ontario and Michigan. While examining specimens of *Synanthedon* at the A.J. Cook Museum at Michigan State University, Taft found a number of *S. helenis* specimens that had been misidentified and labelled by Eichlin as *S. pyri*. Taft et al (2004), also misidentified *S. helenis* as *S. pyri*. These identification errors became apparent while examining DNA barcode sequence data in a global Sesiid barcode survey led by Dr. Franz Puhringer of St. Konrad, Austria. Our examination of the male genitalia of specimens of *helenis*, *pyri* and *scitula* identified by barcoding confirms the presence of three species. Illustrations of the male genitalia of the three species are provided showing the diagnostic characters for identifying the three species.

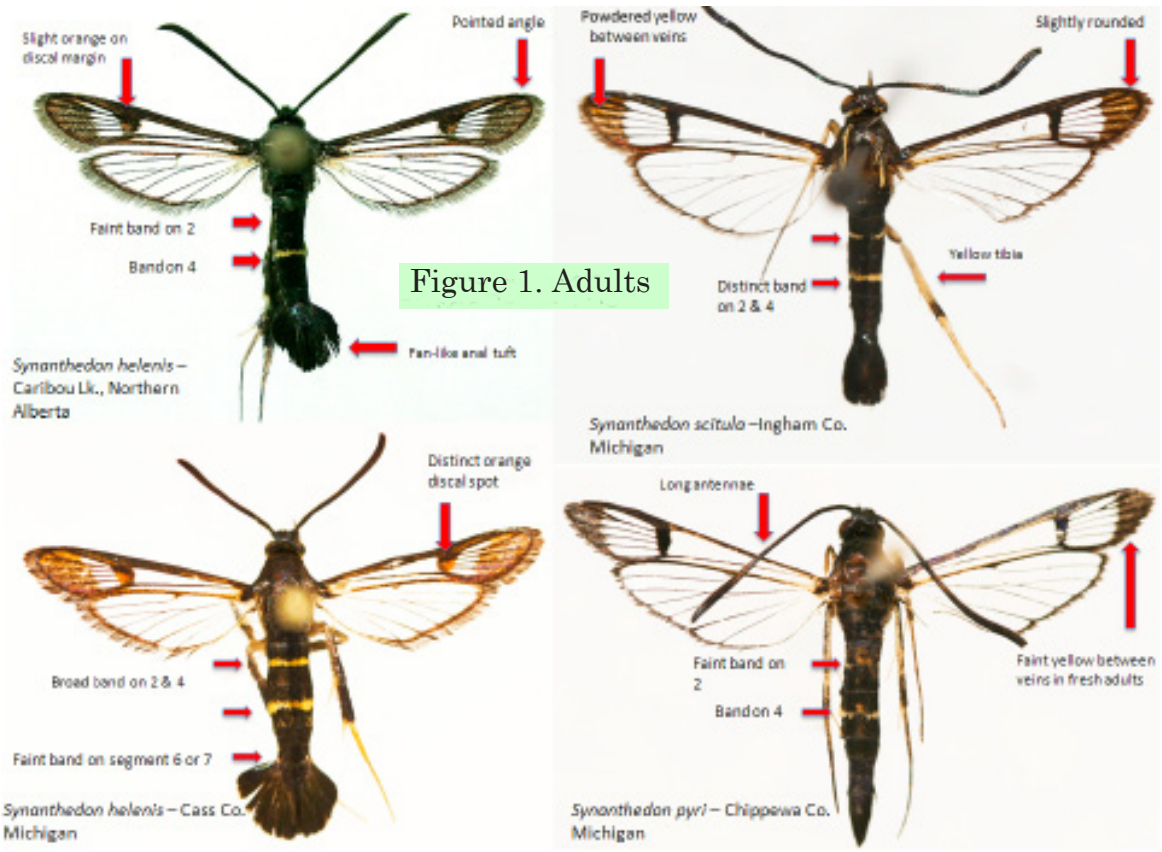


Figure 1. Adults

Figure 2. Ventral view of the abdomens of three Synanthedon species

Literature Cited

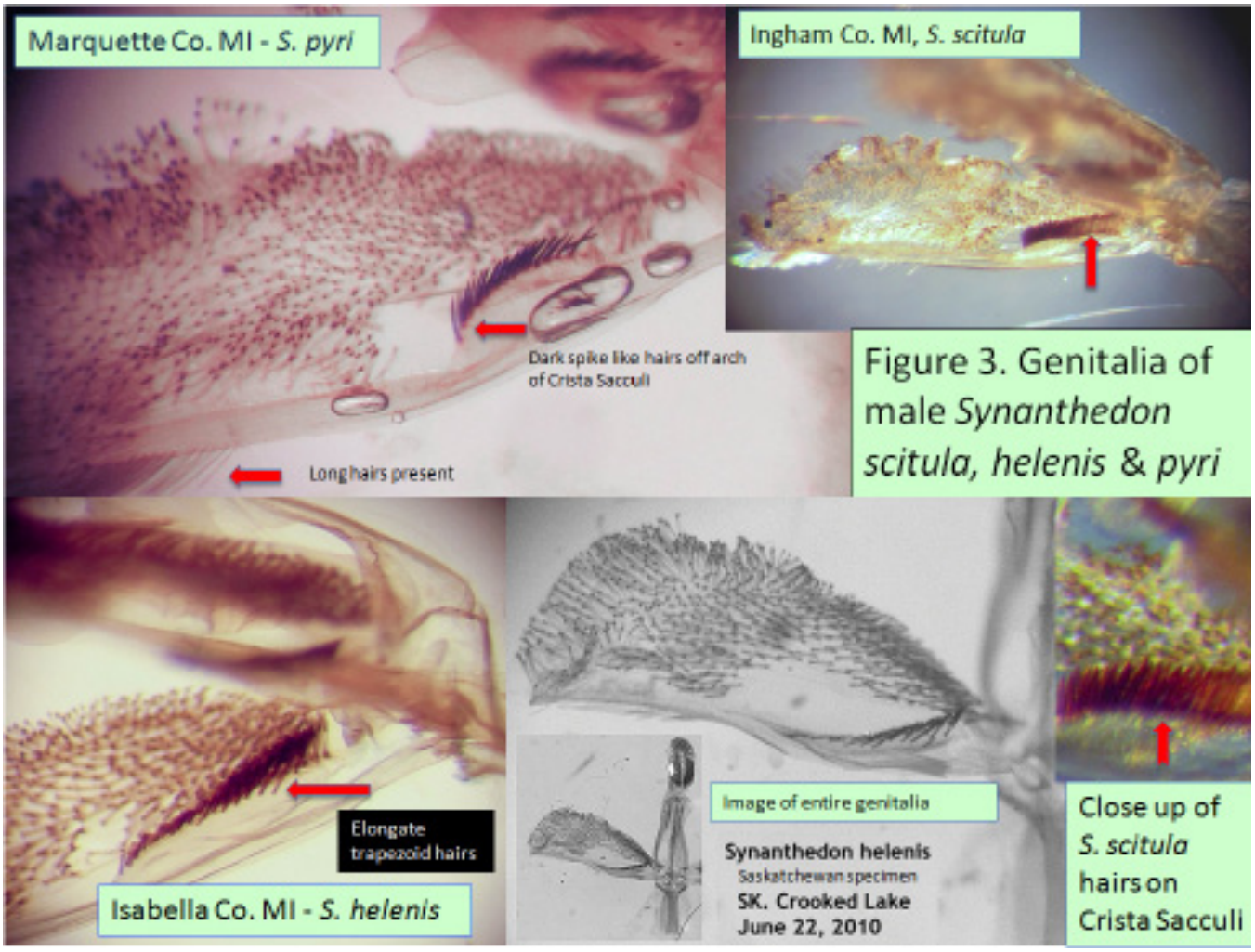
Eichlin, T.D. & W.D. Duckworth.1988. Sesioidea: Sesiidae. In Dominick, R.B. et al., The moths of America North of Mexico. Fasc. 5.1.

Engelhardt, G.P. 1949. The North American Clearwing Moths of the family *Aegeriidae*. U.S. Natl. Mus. Bull. 190:146.

Hansen, J. A., Klingeman, W. E., Moulton, J. K., Oliver, J. B., Windham, M. T., Zhang, A. & Trigiano, R. N. (2012): Molecular Identification of Synanthedonini Members (Lepidoptera: *Sesiidae*) Using Cytochrome Oxidase I. Annals of The Entomological Society of America 105(4), 520-528.).

Looney, C., E. LaGasa,& S. Passoa. 2012. First Records of the Dogwood Borer, *Synanthedon scitula* (Harris) *(Sesiidae*), in the Pacific Northwest: A Potential Threat to Ornamental and Fruit Tree Growers. J. Lepid. Soc. 66 (4), 2012, 171-174.

Taft, W.H., Smitley, D. & J.W. Snow. 1988, revised 2004. A Guide to the Clearwing Borers (*Sesiidae*) of the North Central United States. North Central Regional Publication. No. 394.



Announcements:

64th Annual Meeting of the Lepidopterists' Society, July 28 - August 2, 2015

The Purdue Dept. of Entomology, the Research Collection and Confereneces would like to invite you to attend the 64th Annual Meeting of The Lepidopterists' Society, July 28 - August 2. Residence hall housing is available, as well as a block of rooms at the local Hilton Garden Inn.

Meeting registration is available online at **http://www.entm.purdue.edu/perc/lepsoc2015/**. Early bird pricing ($120 for students and $140 for regular registration) ends June 1, 2015 after which late registration pricing kicks in at $145 for students and $165 for the rest. Talk registrations close on June 1, 2015, so that we can get the printed program online by July 1, 2015. For a complete listing of online contact information, the schedule of events, description of field trips, some accomodation alternatives, and a hard copy registration form see the Spring 2015 News of the Lepidopterists' Society (57:1, pgs. 36-40).

Eagle Hill, Maine seminar July 12 - 18

Hugh McGuinness and Bryan Pfeiffer will be teaching a weeklong seminar on Lepidoptera this summer at Eagle Hill in Steuben, Maine. The course, which is titled "Moths and Butterflies: Identification, Specimen Preparation and Taxonomy," will emphasize identification of macrolepidoptera; the current state of taxonomy in Lepidoptera; the techniques used for observing, studying and surveying butterflies and moths; and various aspects of Lepidopteran conservation. Each day will include a lecture topic, lab work and plenty of field time, both during the day and at night. Because we have two instructors we will have a lot of flexibility in the nature of the course and we plan to adapt the course depending on the interests of the students. Eagle Hill is a wonderful biological station with great food and ample accommodations set on hillside in coastal Maine about 1 hour from Bar Harbor. The course is scheduled to run from the 12th to the 18th of July, 2015. For more information, go to **http://www.eaglehill.us/programs/nhs/nhs-calendar.shtml.**

The Sixth Annual Lepidoptera Course, 16 – 25 August, 2015.

Held at the Southwest Research Station (SWRS) in the Chirichahua Mountains in SE Arizona (a 2 1/2 hour drive from Tucson), the focus of the Lep course is to train graduate students, post-docs, faculty, state and federal employees, and serious citizen-scientists in the classification and identification of adult Lepidoptera and their larvae. Topics to be covered include the biology and systematics of major families of Lepidoptera, an introduction to adult and larval morphology with a focus on taxonomically-important traits, extensive field work that concentrates on both collecting and photographing adults and larvae, collecting and curatorial techniques, genitalic dissection, larval classification, use (and abuse) of DNA bar coding, and general topics in Lepidoptera systematics, ecology, and evolution.

With its extensive series of Sky-Island mountain ranges, SE Arizona has the highest Lepidoptera diversity in the US. With low desert scrub, oak and mixed oak-pine woodland, lush riparian, juniper, Douglas fir, and mountain meadow habitats all within a 40 minute drive from the station, the SWRS is an ideal location from which to sample this diversity (of both habitats and species).

If you want to interact with other Lepidoptera enthusiasts, see a spectacular *Dysschema*, identify the Organ of vom Roth, sort through trap samples with hundreds of species, learn about diversity of Lepidoptera, and enjoy the vistas of SE Arizona, then this course will provide a unique experience.

Partial list of Invited instructors (subject to change):

Rich Brown (Mississippi Entomological Museum), Jennifer Bundy (RD4AG), Chris Grinter (Illinois Natural History Survey), Sangmi Lee (Arizona State University), Chris Schmidt (Canadian National Collection), Bruce Walsh (University of Arizona)

For more information, see **http://research.amnh.org/swrs/education/lepidoptera-course**, or **www.lep-course.org** or contact Bruce Walsh at **jbwalsh@u.arizona.edu**

You can also see photos and comments from students in the 2011 course at their facebook site, "2011 Lep Course, SWRS SEAZ".

ZONE COORDINATORS NEEDED.

Due to a relocation, retirement and a health issue, there are three (3) Season Summary Zone Coordinators positions open.

Zone 1: Far North: Alaska, Yukon, Nunavut & Northwest Territories.

Zone 5: Great Plains: Saskatchewan, Manitoba, North Dakota, South Dakota, Nebraska, Kansas & Oklahoma.

Zone 8: Midwest: Missouri, Kentucky, West Virginia, Indiana, Illinois, Iowa, Minnesota, Wisconsin & Michigan.

If you are interested in becoming a Season Summary Zone Coordinator, please contact the Season Summary Editor for a complete description and requirements.

Leroy C. Koehn, Season Summary Editor, 3000 Fairway Court, Georgetown, KY 40324-9454, Tel: 502-542-7091, Email: **Leptraps@aol.com**

Colorado Digital Libraries publications

Papilio (New Series), edited and published by James A. Scott, is now online (ISSN 2372-9449), treating systematics and biology of butterflies. All issues #1-23 now available as FREE printable pdfs through the Colorado Digital Libraries at **http://digitool.library.colostate.edu**; click on Colorado State University, search for Papilio (New Series).They have open access and may be downloaded, viewed, and printed at no cost. Some issues include #21, *Argynnis* (*Speyeria*) *nokomis nokomis*: geographic variation, metapopulations, and the origin of spurious specimens (Nym-phalidae), by James A. Scott & Michael S. Fisher, 32 p. #22, Systematics and life history studies of Rocky Mountains butterflies, by J. Scott (parts by Norbert G. Kondla & Richard E. Gray), 78 p. #23, Identification of *Phyciodes diminutor, P. cocyta,* and *P. tharos* in northeastern U.S. (Nymphalidae), by J. Scott, 26 p. (Note: various small corrections were made to #21-23, so if you downloaded them before Jan. 10, 2015 you should download them again to get those corrections). Print quality is improved over some originals, esp. larger readable type in #6, better photos in #8, and b/w photos now color in #12. Printed copies can still be obtained (at cost of printing, pos-tage, & handling) from J. Scott including the separate nice commercially-printed color plates in #12 and #18. Subjects treated are systematics related in #1, 8-9, 11-12, 18-23 on various butterflies and #5, 7, 10, 13, 23 on Phyciodes, about 4000 new hostplant records and life histories (mostly #2, 4, 6, 14, 22), corrections/reviews of 58 North American butterfly books in #19, biological catalogue of North American butterflies in #20, building storage drawers (#15, 16), insect conservation laws in #17, and distribution of Caribbean butterflies in #3.

These are listed under the C.P. Gillette Museum of Arthropod Diversity. Most numbers of the Contributions of the C.P. Gillette Museum of Arthropod Diversity are now also served on line as pdf's with open access. We hope to have all of the series served on-line by the end of the calendar year.

Paul A. Opler, Assistant Director, C.P. Gillette Museum, and James Scott, JameScott@juno.com, 60 Estes St., Lakewood, CO 80226-1254, USA

PayPal is the easy way to send money to the Society

For those wishing to send/donate money to the Society; purchase Society publications, t-shirts, and back issues; or to pay late fees, PayPal is a convenient way to do so. The process is simple: sign on to www.PayPal.com, and navigate to "Send Money", and use this recipient e-mail address: **kerichers@wuesd.org**; follow the instructions to complete the transaction, and be sure to enter information in the box provided to explain why the money is being sent to the Society. It's as simple as that—and be sure to let us know if you have any difficulties with the process.

Society of Kentucky Lepidopterists

The Society of Kentucky Lepidopterists is open to anyone with an interest in the Lepidoptera of the Great State of Kentucky. We are a very active organization. We have two or three field meetings every year. The schedule for the remaining 2015 meetings is as follows:

Late Summer Meeting: Red Bird WMA Daniel Boone NF, Leslie County: 7, 8 & 9 August

The Annual Meeting will be held in November at the Insect Museum of University of Kentucky, Lexington, KY.

Annual dues are $15.00

To join the Society of Kentucky Lepidopterists, send dues to: Les Ferge, 7119 Hubbard Ave., Middleton, WI 53562

National Moth Week 2015: The Year of the Sphinx Moth, July 18-26, 2015

The fourth annual National Moth Week will be held on July 18-26, 2015. Last year, there were hundreds of participants in all 50 US states and in 43 countries. The goal of National Moth week is to focus much needed attention on moths and their incredibly biodiversity and to help document their distribution. The event is free and everyone is welcome to participate. Registration forms can be found at nationalmothweek.org. Please register your location and submit your data and photographs to our diverse global partners. They can be found on the National Moth Week website at nationalmothweek.org. While National Moth Week celebrates the diversity of all moths, we like to shine a light—literally and figuratively—on a certain family of moths each year. Last year, we celebrated the year of the Silk moth (Saturniidae). This year, we are celebrating the family Sphingidae. Robust fliers with distinctive wing shapes, the sphinx moths consist of about 1,463 species world-wide and about 124 species in North America. For inquiries or information visit the National Moth week website at nationalmothweek.org or email David Moskowitz @ **dmoskowitz@ecolsciences.com**

Continued on p. 96

First Encounters:
My First Encounter with a Monarch

Greg Pohl

#62, 52152 Range Rd. 225 Sherwood Park, AB Canada T8C1C6 **gpohl@nrcan.gc.ca**

I grew up in Edmonton, Canada, at the edge of the Boreal forest, and spent alot of time outdoors at the family cottage. Like most kids, I was fascinated with insects, and like many of you, I never outgrew that interest. I owe alot to my mother who, instead of getting grossed out when I brought bugs to show her, encouraged me to look at them with her. By the time I was four, she had sewn me a butterfly net (Fig. 1), and my father had built me some wooden specimen boxes. I always knew what I wanted to do when I grew up. Now as an adult I'm living the dream, working as a biologist with the federal government in Edmonton. I get paid to identify forest insects, manage a collection, and carry out biodiversity work with beetles and moths. I continue to collect insects, focussing primarily on micromoths. I've always been attracted by the potential for new discoveries that goes hand in hand with our lack of knowledge about them.

When I was growing up in western Canada, long before the internet, there weren't alot of resources for young entomologists. My most trusted book was Herbert S. Zim's "Golden Field Guide to the Insects". I knew all of those beautiful color illustrations like the back of my hand, even though many of them depicted species I could only dream about seeing in real life - wonderful creatures like praying mantids, mormon crickets, and cucumber beetles lived very far to the south. There were no regional butterfly books available then either. I distinctly remember one general butterfly book in the library (can't recall the name or author), that had glossy colour maps of species ranges in the USA. Like many American books, it depicted the USA as an island floating in space, unconnected and seemingly oblivious to Canada or Mexico. As a result, many species had ranges that ended in a perfectly straight line at the 49th parallel. Anyway, resources were a bit limited for a Canadian kid, but I figured out how to pin things, and muddled along making identifications by matching my specimens to whatever photos I could find.

In 1972, when I was seven, my family took a summer road trip across southern British Columbia. One day we were at Osoyoos, in the Okanagan Valley (Americans call it the Okanogan, but to us Canadians it's spelled Okanagan), right on the American border. On a whim my dad decided we should go across the line, "just to say we'd been to America". Back then, decades before 9/11, it was pretty easy, as long as you didn't look like a hippy. So we went through customs and drove across the 49th parallel to the American border town of Oroville, Washington. Suddenly it occurred to me; we'd just entered the range of monarch butterflies! I'd dreamed of finding a monarch some day, and now was the chance I'd been waiting for. There was no point looking for them just up the road in Osoyoos, but here in the USA, well... maybe, please let there be one! I was glued to the window as we drove into Oroville, scanning the roadside and wondering what milkweed looked like. As we walked up and down Main street in that small town, all I could do was look for monarchs. And then (cue the angelic voices), everything else in my world faded away. A big red and black butterfly soared towards me with that distinctive flight that I was seeing for the first time, and would never ever forget. Yes! That book had it exactly right! Monarchs DID live here, just up to the 49th. Time probably stood still for a moment, but then something intruded into my peripheral vision. A car was coming up the street, and it was on a collision course with the monarch! I stood on the sidewalk totally helpless, watching it all in slow motion as the monarch soared across the road, into the path of the speeding car. The monarch got whacked out of the sky, and spiralled gently down to earth like a giant red maple seed, to land in the gutter at my feet. Quite dead, but not actually very damaged! I cradled it in my hands as we drove back into Canada. I had nothing to declare; this was long before Canada listed monarchs as a "Species of Special Concern". I brought it back to our campsite, stuck a sewing pin carefully through the thorax, and spread the wings on my spreading board just as I'd learned from the book. When we got home, I proudly added the prize to my collection. I've still got the specimen (Fig. 2), though somewhere along the way I had to glue the forewings back on. It would be 15 years before I'd see another one, in South America. Since then I've seen them in a few places in southern Canada, and I realize how misleading that American butterfly book was. Of course they're not uncommon in the Okanagan Valley of southern BC. They've even made it as far north as Edmonton a few times, though I've never actually seen them here myself. Nope, I had to get south of the 49th parallel to see a monarch!

www.lepsoc.org and https://www.facebook.com/lepsoc

Fig. 1. The young author (middle) still dreaming of catching his first monarch.

Fig. 2. My prized roadkill.

Membership Updates

Chris Grinter

Includes ALL CHANGES received by 6 May 2015

New and Reinstated Members: members who have joined/renewed/been found/or rescinded their request to be omitted since publication of the 2014 Membership Directory; all in U.S.A. unless noted otherwise

Crumpler, Jimmy: 12 Regalia Drive, Novato CA 94947
Deidesheimer, Joseph A.: [address omitted on request]
Delgado, Jennifer Paniagua: 3A Cond. Lucerna Apt. 2-C, Carolina PR 00983
Gorneau, Jacob: 3806 Rt. 67, Freehold NY 12431
Hamm, Christopher (Ph.D.): [address omitted on request]
Hay-Roe, Mirian Medina (Ph.D.): 3627 NW 75th Terrace, Gainesville FL 32606
Kerr, Morgan: 19342 Gosnell Road, Leonardtown MD 20650
Leslie, Chris: 731 Algonquin Street, Ventura CA 93001
Long, Elizabeth (Ph.D.): Department of Entomology, Natural History Museum of Los Angeles County, 900 Exposition Blvd., Los Angeles CA 90007
Martin, Ronald A.: P.O. Box 813, Smithville TX 78957
Moulds, Dr. Max: 6 Victor Place, Kuranda, 4881 QLD AUSTRALIA
Ortiz, Hector Vargas: Los Mapuches 081 Arica, Arica, 1000000, CHILE
Payne, Rose: 2991 Montpelier Station Road, Musella GA 31066
Reilly, Patrick: 114 Sunset Road, Charlotte VT 05445
Thompson, Marisa: 2605 East Tarragon Way, Fresno CA 93720
White, Peter (Ph.D.): Lyman Briggs College, Michigan State University, 919 E Shaw Lane, 36-E. East Lansing, MI 48823

Address Changes (all U.S.A. unless noted otherwise)

Bliss, Kenneth: 1321 Huntington Trail, Round Rock TX 78664-9316
Braby, Dr. Michael F.: Division of Evolution, Ecology and Genetics, Research School of Biology, The Australian National University. Canberra ACT 0200 AUSTRALIA
Churchill, Mark: 586 Sharon Way, Bolingbrook IL 60440
Ewer, Nancy R.: 321 8th Ave., Helena MT 59601
Kelton, Janet: 4750 West Flying Diamond Drive, Tucson AZ 85742
McCarty, Megan: 286 Littleton Street, Apt 308, West Lafayette IN 47906
Royer, Ronald Aaron: P.O. Box 54, Backus MN 56435
Santry, Rob: 2681 SW Trinity Way, Grants Pass OR 97527
Watkins, Reed A.: 7080 Upland Ridge Drive, Adamstown MD 27170

Coronidia orithea (Sematuridae), Huejutla de reyes, Hidalgo, México, 5-12-12, photo by Eduardo Axel Recillas Bautista (eduardo_ax09@hotmail.com); see Yolcatzin at www.yolcatzin.com.mx, © Las maravillas de la naturaleza.

The Sleepy Orange transits the Pacific: a new butterfly species for Hawaii

Daniel Rubinoff[1], Janis Matsunaga[2], Forest Starr[3], Kim Starr[3], and William Haines[1]

[1]310 Gilmore Hall, Department of Plant and Environmental Protection Sciences, University of Hawaii, Honolulu, HI 96822 **rubinoff@hawaii.edu**
[2] Plant Pest Control Branch, Hawaii Department of Agriculture, 1428 S. King St., Honolulu, HI 96814
[3]University of Hawaii, Pacific Cooperative Studies Unit, 149 Hawea Pl., Makawao, Maui, Hawaii 96768

Abaeis (*Eurema*) *nicippe* (Cramer, 1779), native to the Americas, is widespread from the southern tier of the United States, south, to Brazil (Scott, 1986). In summer, it regularly strays well north of its permanent range, rarely reaching Canada. The species overwinters as an adult, and has two forms which are most easily distinguished by coloration of the underside of the wings: light yellow in summer and reddish-brown in winter, both with dark brown maculation. The larval host plants, various species of *Senna*, are widely planted as ornamentals.

On December 23, 2013, R. McGough observed *A. nicippe* adults and pupae on Senna in the town of Waialua, on the North Shore of the island of Oahu. This represents only the third pierid species to become established in Hawaii; the two others are *Pieris rapae*, which was introduced over a century ago, and *Phoebis agarithe*, which was first detected in 2004 (HDOA, 2005).

A. nicippe was sighted again on Oahu in February 2014, and then quickly became relatively common, with sightings across the island in 2014, including in the city of Honolulu. By October 2014, *A. nicippe* was extremely abundant on Maui, with an egg seen by F. and K. Starr on *Cassia* sp. By the end of 2014, the butterfly was also sighted or collected on Kauai, Molokai, Big Island, and even the tiny island of Kahoolawe. Sightings occurred from sea level up to at least 6,800 feet on the slopes of Haleakala on Maui. This rapid expansion across the Hawaiian Islands demonstrates the strong dispersal ability of *A. nicippe*. It is remarkable how quickly and thoroughly *A. nicippe* spread throughout the archipelago, especial considering the high levels of single island endemism in many native groups of Hawaiian Lepidoptera (e.g. Haines et al. 2014), which suggest that populations frequently become isolated on islands.

Mid-elevation sites on Maui, which experienced the most profound population explosion in October 2014, report very few individuals in February 2015, which could be a sign of population collapse, or cyclic dormancy of the adults, since the montane areas do experience significantly cooler winter seasons. The reddish-brown winter form of *A. nicippe* has not been recorded yet in Hawaii, which may be related to the Archipelago's climate and latitude. Specific sightings or collection data follow:

Material Examined

All material is deposited in the University of Hawaii Insect Museum (UHIM) and Hawaii Department of Agriculture Insect Collection (HDOA).

Kauai

Kokee State Park, Mohihi Rd. 22.1311, -159.6376. 6 December 2014. W. Haines 3 adults. (UHIM)

Oahu

1) Waialua, 23 December, 2013, Adults on *Senna surrattensis*. coll: R. McGough 20 adults and 4 pupae (HDOA). **2)** Kaena Point, 27 February 2014, 4 adults (HDOA). **3)** Waianae, Kaala trailhead, Waianae Valley Rd., 21.4829, -158.1551 27 Jan 2015. W. Haines and C. Maeda. 1 adult (UHIM).

Maui

1) Haiku, Kokomo, Kailiili Rd. 20.8666, -156.3046. (12 October 2014). W. Haines. 1 adult (UHIM). **2)** Olinda, Makawao, Olinda, 149 Hawea Pl., 11 October, 2014. F. and K. Starr 5 adults (UHIM). **3)** Olinda , Makawao, Olinda, 149 Hawea Pl., 1 December, 2014 F. And K. Starr 4 adults (UHIM)

Non-vouchered sightings

Kauai

1) Kokee State Park, along Kawaikoi Stream Trail, 4 September, 2014. One adult flying at large. N. Reimer. **2)** Kokee State Park, cabins near Kokee Lodge, 6 September, 2014. One adult flying at large. N. Reimer.

Oahu

1) Pawa'a, Honolulu. September, 2014. One adult puddling near building. N. Reimer, J. Matsunaga, B. Kumashiro. **2)**Honolulu, Manoa, 29 November, 2014. One adult flying by. D. Rubinoff. **3)** Makaha Valley, 9 September, 2014. One adult flying among weeds and grasses. J. Matsunaga. **4)** Kawainui Marsh, January-February, 2015. Abundant

adults flying at large. F. Joy. **5)** Waianae Kai, 31 January, 2015. Adults flying around alien forest. Abundant. F. Joy. **6)** Pohakea, Kunia, January, 2015. Adults flying around farmlands. Abundant. F. Joy. **7)** Ka'au Crater, 14 February, 2015. 3 adults flying at large. F. Joy. **8)** Poamoho Ridge Trail, 1 February, 2015. One adult flying in a mixed native and invasive habitat. J. Matsunaga.

Maui

1) Olinda, (visiting the flowers of watermelon and other plants), Makawao, Pukalani, and Kula. 1-15 October, 2014. Abundant. F. And K. Starr. **2)** Keanae School (Hana Hwy.). 27 October 2014. Abundant. F. And K. Starr. **3)** Hosmer's Grove, Haleakala National Park, 6,800'. Early November, 2014. F. And K. Starr. **4)** Nakula Natural Area Reserve, ~5,000', 13-20 November, 2014. Adults flying around native area with mostly *Acacia koa*, *Metrosideros polymorpha*, and grasses. Abundant. J. Matsunaga.

Molokai

Kaunakakai to Kakahaia, 25 October, 2014. Marginally abundant along the south shore. F. and K. Starr.

Kahoolawe

Kaukaukapapa. One individual sipping from a mao (*Gossypium*) flower on 17 December, 2014. F. and K. Starr.

Hawaii (Big Island)

Makaula O'oma Tract of Honua'ula Forest Reserve on 27, January 2015. T. Poklen.

Acknowledgements

We thank F. Joy, N. Reimer, B Kumashiro, T. Poklen for assistance with reporting sightings of *A. nicippe*. We thank Andrew Warren for confirming the identification and helpful discussion. This work was supported by the USDA National Institute of Food and Agriculture, Hatch project HAW00956-H managed by the College of Tropical Agriculture and Human Resources. Specimens are deposited in the University of Hawaii Insect Museum (UHIM), or the Hawaii Department of Agriculture Insect Collection (HDOA).

References

Scott, J. 1986. Butterflies of North America. Stanford University Press.

Haines, W. P., P. Schmitz and D. Rubinoff. 2014. Ancient diversification of *Hyposmocoma* moths in Hawaii." *Nature Communications* **5**: 3502 **DOI: 10.1038/ncomms4502**.

Hawaii Department of Agriculture. 2005. Hawaii Department of Agriculture's Annual Report for Fiscal Year 2004. Ed Janelle Saneishi. Honolulu, HI: Hagadone Printing Company. Available at: **http://hdoa.hawaii.gov/wp-content/uploads/2013/01/AR05-Text.pdf** (page 24).

Kawainui Marsh, Oahu, January 2015. F. Joy.

□, Maui, Olinda, 11 October, 2014. F. & K. Starr, coll. (UHIM)

□, Maui, Olinda, 11 October, 2014. F. & K. Starr, coll. (UHIM)

Maui, Olinda, 11 October, 2014. F. & K. Starr, coll. (UHIM)

Dominican Pyraloidea for the tropical & field biology program at Texas A&M

M. Alma Solis

Systematic Entomology Laboratory (SEL), ARS, USDA, Smithsonian Institution, PO Box 37012, National Museum of Natural History, E-517, MRC 168, Washington, D.C. 20013 **Alma.Solis@ars.usda.gov**

Selected Pyraloidea of Dominica

Images are 1.5X life-size

Herpetogramma phaeopteralis (Guenée)

Argyria centrifugens Dyar

Polygrammodes elevata (Fabricius)

Eulepte concordalis Hübner

Glyphodes sibillalis Walker

Palpusia terminalis Dognin

Trischistognatha palindialis (Guenée)

Maruca vitrata (Fabricius)

Syndera jarbusalis (Walker)

Ercta vittata (Fabricius)

Anania inclusalis (Walker)

Zenomorpha discophoralis (Hampson)

Crambus moeschleralis Schaus

Hymenia perspectalis (Hübner)

Salbia haemorrhoidalis (Guenée)

Ategumia ebulealis (Guenée)

Samea ecclesialis Guenée

Syngamia florella (Cramer)

Deuterophysa albilunalis (Hampson)

Neoleucinodes torvis Capps

*Omiodes indicata (*Fabricius)

Apogeshna stenialis (Guenée)

Selected Pyraloidea of Dominica

Images are life-size

Sparagmia gonoptera (Latreille)

Azochis rufifrontalis (Hampson)

Azochis euvexalis (Möschler)

Hoterodes ausonia (Cramer)

Pantographa limata Grote & Robinson

Epicorsia oedipodalis (Guenée)

Ategumia matutinalis (Guenée)

Microthyris anormalis (Guenée)

Syllepte opalisans (Felder & Rogenhofer)

Terastia meticulosalis Guenée

Omiodes cuniculalis Guenée

Pilocrosis ramentalis Lederer

Cliniodes euphrosinalis (Möschler)

Herpetogramma decora Dyar

Agathodes designalis Guenée

Pleuroptya silicalis (Guenée)

Microthyris prolongalis (Guenée)

Portentomorpha xanthialis (Guenée)

Herpetogramma bipunctalis (Fabricius)

Diaphania nitidalis (Cramer)

Diaphania infimilalis (Cramer)

Diaphania hyalinata (Linnaeus)

Palpita quadristigmalis (Guenée)

A few years ago James Woolley, Department of Entomology, Texas A&M University, invited me to participate in the Study Abroad Program in Tropical and Field Biology for undergraduates taught in Dominica at the Archbold Tropical Research and Education Center. I could not participate due to time constraints, but I provided 2 plates of large, common pyraloid moths figured in this publication for use in a student project. Kerstin Alander, an undergraduate at Texas A&M, conducted a research project in 2013 entitled "Survey on the Superfamily Pyraloidea and their relatives in the wet secondary rainforest on the island of Dominica." A pdf of the report can be found on **dominica.tamu.edu** under the 2013 Student Projects or under the Research Topic of Insects.

The pyraloid moth collection at the National Museum of Natural History (NMNH), Washington, D.C. is possibly the largest in the world with a little over 350,000 specimens. It includes an extensive collection from Dominica because in 1964-65 the Smithsonian Institution conducted the Bredin-Archbold-Smithsonian Survey of Dominica. Pyraloid moths were collected by various entomologists at the NMNH Department of Entomology: lepidopterists- J. F. Gates Clarke, Thelma M. Clarke, Donald R. Davis, E. L. Todd, trichopterist- Oliver S. Flint, Jr., and coleopterist- Paul Spangler. Over the years the latter two, who work on aquatic insects, greatly enhanced the NMNH collection of Acentropinae, a pyraloid subfamily with aquatic stages. In 1978 Jay Shaffer, George Mason University (retired) specifically wrote a paper on a subfamily of the Pyraloidea entitled "Bredin-Archbold-Smithsonian Survey of Dominica: Phycitinae (Lepidoptera: Pyralidae)" [Proceedings of the Biological Society of Washington 91(1):5-26]. The material represents long series of specimens important to the study of variation within species and has been utilized by pyraloidologists for taxonomic studies. Two examples are: "Transfer of all Western Hemisphere Cybalomiinae to other subfamilies: *Elusia* Schaus, *Dichochroma* Forbes, *Schacontia* Dyar, *Cybalomia extorris* Warren, and *C. lojanalis* (Dognin)" [Solis, M. A. 2009. Proceedings of the Entomological Society of Washington 111: 493-504] and "Revision of *Cliniodes* Guenée" [Hayden, J. 2011. Annals of Carnegie Museum 79: 231-247].

All of the species figured belong to the Crambidae in the subfamily Spilomelinae, except the following that belong in other subfamilies: *E. oedipodalis* (Pyraustinae), *C. euphrosinalis* (Odontiinae), *T. palindialis* (Glaphyriinae), *A. inclusalis* (Pyraustinae), *C. moeschleralis* (Crambinae), *A. centrifugens* (Crambinae). Most of the moths figured in Plate 1 and 2 were collected 2 miles NW of Pont Casse by D. R. Davis. The images were taken by and plates assembled by Mark Metz, SEL, USDA.

www.lepsoc.org and
https://www.facebook.com/lepsoc

Continued from p. 78 (next page)

Fig. 3. Remains of a tent-building *Anaea troglodyta floridalis* larva following *Chetogena scutellaris* parasitism, 1 February 2014, Long Pine Key, Everglades National Park (Miami-Dade County, Florida) (Photo Credit: Holly Salvato).

Literature Cited

Cech and Tudor. 2005. Butterflies of the East Coast, An Observer's Guide. Princeton University Press, Princeton, New York, 345 pp.

Hennessey, M. K. and D. H. Habeck. 1991. Effects of mosquito adulticides on populations of non-target terrestrial arthropods in the Florida Keys. U. S. Fish and Wildlife Service and the Univ. of Florida Cooperative Wildlife Research Unit (Unpublished Final Report). Gainesville, Florida. 76 pp.

Matteson, J. H. 1930. *Anaea portia* - the leaf-wing and a list of the Rhopalocera of Miami, Florida. American Nature Association, Nature Magazine. 16 pp.

Minno, M. C. and T. C. Emmel. 1993. Butterflies of the Florida Keys. Scientific Publishers, Gainesville, Florida. 168 pp.

Minno, M. C., J. F. Butler, and D. W. Hall. 2005. Florida Butterfly Caterpillars and Their Hostplants. University Press of Florida, Gainesville, Florida.

Opler, P.A., and G.O. Krizek. 1984. Butterflies east of the Great Plains. The John Hopkins University Press, Baltimore, MD.

Salvato, M.H. and M.K. Hennessey. 2003. Notes on the historic range and natural history of *Anaea troglodyta floridalis*. Journal of the Lepidopterists' Society 57: 243-249.

Salvato, M.H. and H. L. Salvato. 2010. Notes on the status and ecology of *Anaea troglodyta floridalis* in Everglades National Park. Journal of the Lepidopterists' Society 64: 91-97.

Salvato, M.H., H.L. Salvato, and M.K. Hennessey. 2009. *Chetogena scutellaris* (Diptera: Tachinidae) and endoparasite of larval *Anaea troglodyta floridalis*. News of the Lepidopterists' Society. 51: 85, 101, 106.

Schappert, P. 2007. Lifestyles of the scaled and beautiful: goatweed and tropical leafwing. American Butterflies. 15: 36-41.

Schweitzer, D. F., M. C. and D. L. Wagner. 2011. Rare, Declining, and Poorly Known Butterflies and Moths (Lepidoptera) of Forest and Woodlands in the Eastern United States. Technical report FHTET-2011-01. United States Department of Agriculture. Morgantown, WV.

Smith, D. S., L. D. Miller and J. Y. Miller. 1994. The Butterflies of the West Indies and South Florida. Oxford University Press, New York. 264 pp. 32 pl.

Worth, R. A., K. A. Schwarz and T. C. Emmel. 1996. Notes on the biology of *Strymon acis bartrami* and *Anaea troglodyta floridalis* in south Florida. Holarctic Lepid. 3:52-65.

Tent building by larval *Anaea troglodyta floridalis* (Nymphalidae)

Mark Salvato[1], Holly Salvato[1] and Jimi Sadle[2]

[1]1765 17th Ave SW, Vero Beach, FL 32962, USA, **anaea_99@yahoo.com**
[2]Everglades National Park, 40001 State Road 9336, Homestead, FL 33034 **jimi_sadle@nps.gov**

The federally endangered Florida leafwing, *Anaea troglodyta floridalis* occurs locally within the pine rocklands of Everglades National Park (Minno and Emmel 1993; Smith et al. 1994), where it is endemic. Hennessey and Habeck (1991), Worth et al. (1996), and Salvato and Salvato (2010) described many aspects of *A. t. floridalis* natural history. More recently, the authors have conducted intensive monitoring of *A. t. floridalis* larvae within the Long Pine Key region of the Everglades (Miami-Dade County, Florida) in order to identify mortality factors.

Late instar goatweed (*Anaea andria*) and tropical (*A. aidea*) leafwing larvae tie together leaves with silk to form a nest or shelter in order to evade parasitism and predation (Opler and Krizek 1984; Minno et al. 2005; Schappert 2007; Paulette Hayward Ogard and Sara Bright, pers. comm.). Smith et al. (1994) also indicated that late instar larvae of several *Anaea* species in the West Indies use leaf tents. However, for *A. t. floridalis* this behavior appears to be less obligatory. Matteson (1930) noted that Florida leafwing larva "made no attempt to cover itself with leaves for protection" relying instead on cryptic coloration. Salvato and Hennessey (2003) based on numerous observations of older *A. t. floridalis* on Big Pine Key and within the Everglades, did not report shelter building. Similarly, Minno and Emmel (1993) and Worth et al. (1996) also indicated that these larvae remain exposed on the hostplant. Conversely, Cech and Tudor (2005) and Schweitzer et al. (2011) have noted tent building by larval *A. t. floridalis*.

On 14 February 2013, JS observed a late instar *A. t. floridalis* larval shelter constructed of several pineland croton (*Croton linearis*) leaves, held together with silk (Figs. 1-2). While enclosed, only the head and the upper part of the body were visible through an opening in the shelter. This individual proceeded to build, and then abandon two additional shelters throughout development. During this period, a second *A. t. floridalis* larva on the same pineland croton plant was not observed using or creating tents. Subsequently, on 23 January 2014, MS and HS observed several late instar *A. t. floridalis* larvae within a 10-meter stretch of hostplant in which some individuals had constructed tents (n = 2), something intermediate (n = 1) or remained exposed (n = 1). One of the shelter building larvae had been parasitized by *Chetogena scutellaris* (Tachinidae) (Fig. 3); suggesting tent use may provide little protection from this frequent parasitoid of *A. t. floridalis* (Salvato et al. 2009).

The above encounters represent our first observations of larval tent building following numerous field observations of late instar *A. t. floridalis* larvae by MS (approximately 114 [from 1999 to 2014] and 47 for JS [2008 to 2013]) in the Everglades. The scarcity in recent observations of this behavior suggests it may be rare or ephemeral within the extant *A. t. floridalis* population. Additionally, this behavior may only occur locally. All of our shelter-constructing larval observations came from a relatively narrow stretch of western Long Pine Key, whereas concurrent surveys of *A. t. floridalis* larvae elsewhere in the region revealed none of this activity.

Figs. 1-2. A late instar *Anaea troglodyta floridalis* larva within a silken tent shelter on *Croton linearis*, as photographed on 14 February and 20 February 2013, Long Pine Key, Everglades National Park (Miami-Dade County, Florida) (Photo Credits: Jimi Sadle).

Continued on p. 77 (previous page)

The Marketplace

IMPORTANT NOTICE to ADVERTISERS: If the number following your ad is "571" then you must renew your ad before the next issue if you wish to keep it in the Marketplace!

New Advertising Statement: The News of The Lepidopterists' Society accepts advertising related to Lepidoptera and consistent with the purposes of the Society free of charge. Other types of advertising will not be accepted, regardless of the source. Acceptability of advertisements for publication is at the discretion of the News editor.

Research Request

WANTED: Observations, photos, specimens of larvae and adults of the Spotted Tussock Moth, *Lophocampa maculata*, from all areas of North America, recent or old data. Records from far northern Canada, the desert SW, southern Appalachians and Pacific Coast are especially needed to define range. Records of early or late season observations are particularly valuable. All larval photographs are useful, especially if they show unusual patterns of coloration. Specimens are desired for future genetic analysis. Contact Ken Strothkamp, Lewis & Clark College and Portland State University (**kgs@lclark.edu** or **kstrot2@pdx.edu**) for more information on the project. 571

Wanted: Buckeye butterflies (genus *Junonia*) of all 3 *Junonia* species from the Florida counties of Collier, Broward, Monroe, and Miami-Dade for a Masters project trying to reconstruct the invasion history of tropical buckeyes into Florida. Historical material of any vintage very valuable to our study. 1990's currently under-sampled by the project, but all dates needed. We genotype using DNA from single legs, so if desired precious specimens can be returned largely intact. Jeffrey Marcus, Dept. Biological Sciences, Univ. Manitoba, Winnipeg, Manitoba R3T 2N2, Canada; 1-204-474-9741; **marcus@cc.umanitoba.ca** 572

Livestock

FOR SALE: Hyalophora cecropia eggs June-July 2015. $15/dozen, $6/each additional dozen. Contact me (Ben McAllister) at ben.d.mcallister@gmail.com. 571

Books/Journals

FOR SALE: Books and Literature (mostly Lepidoptera) worldwide coverage. I want to sell duplicates from my library. For lists send an email to **metzlere@msu.edu.** 571

FOR SALE: Journal of the Lep Soc, Vol. 6-49, 50 #s 1 & 3; Vol. 21 only #1. Price: $250.00 + shipping; weight ± 60 lbs. Journal of Research on the Lepidoptera, Vol. 1-36, missing Vol. 24 #3 & Vol. 27 #s 3 & 4. Price $300.00 + shipping; weight ± 45 lbs. If multiple bids, I prefer selling to youngest bidder for greatest use of these Journals over time. U.S. only; payment by check or money order. Peter Hubbell, 6200 N. Via Ranchero, Tucson, AZ 85704; 520-229-3560, **peterhubbell@q.com**. 571

The aim of the Marketplace in the **News of the Lepidopterists' Society** is to be consistent with the goals of the Society: "to promote the science of lepidopterology...to facilitate the exchange of specimens and ideas by both the professional and the amateur in the field,..." Therefore, the Editor will print notices which are deemed to meet the above criteria, without quoting prices, except for those of publications or lists.

Only members in good standing may place ads (but see top of next column). **All advertisements are accepted, in writing, for two (2) issues unless a single issue is specifically requested.**

All ads contain a code in the lower right corner (eg. 564, 571) which denotes the volume and number of the **News** in which the ad first appeared. **Renew it Now!**

Note: All advertisements must be renewed before the deadline of the third issue following initial placement to remain in place.

Advertisements should be under 100 words in length, or **they may be returned for editing.** Some leeway may be allowed at the editor's discretion. Ads for Lepidoptera or plants must include full latin binomials for all taxa listed in your advertisement.

The Lepidopterists' Society and the Editor take no responsibility whatsoever for the integrity and legality of any advertiser or advertisement. Disputes arising from such notices must be resolved by the parties involved, outside of the structure of The Lepidopterists' Society. Aggrieved members may request information from the Secretary regarding steps which they may take in the event of alleged unsatisfactory business transactions. A member may be expelled from the Society, given adequate indication of dishonest activity.

Buyers, sellers, and traders are advised to contact state department of agriculture and/or ppqaphis, Hyattsville, Maryland, regarding US Department of Agriculture or other permits required for transport of live insects or plants. Buyers are responsible for being aware that many countries have laws restricting the possession, collection, import, and export of some insect and plant species. Plant Traders: Check with USDA and local agencies for permits to transport plants. Shipping of agricultural weeds across borders is often restricted.

No mention may be made in any advertisement in the **News** of any species on any federal threatened or endangered species list. For species listed under CITES, advertisers must provide a copy of the export permit from the country of origin to buyers. **Buyers must beware and be aware.**

New *Eucosma* book published by the Wedge

The Wedge Entomological Research Foundation announces publication of its newest book: "*Eucosma* Hübner of the Contiguous United States and Canada (Lepidoptera: Tortricidae: Eucosmini)" by Donald J. Wright and Todd M. Gilligan. The book will be published mid-April 2015. The retail price is $90.00, however the Wedge Entomological Research Foundation is offering an early-bird-special discounted price of $80.00 (plus shipping and handling) for all orders received by 1 August 2015. Please go to the Foundation's website www.wedgefoundation.org or contact Eric H. Metzler, Managing Director, metzlere@msu.edu for details on ordering books from the Foundation. Several of your favorite retailers of entomology books will also have copies available. Don't forget 1 Aug 2015 for the discounted price. 571

FOR SALE: Hayward, K. J. Genera et Species Animalium Argentinorum TomusPrimus and Secundus Insecta Lepidoptera (Rhopalocera) Hesperiidae (2 vols). Rare, beautiful condition, only 1000 copies printed. Each copy is numbered and signed by the editor. Volume1 is #857, volume 2 is #694. Text in Spanish. Price for both: $1000.00. Weed, C. M. Butterflies Worth Knowing. 1923. $15.00. d'Abrera, B. The Butterflies of Ceylon. $140.00 Temple, V. Butterflies And Moths In Britain, $5.00; South African Butterflies A MONOGRAPH OF THE FAMILY LYCAENIDAE Hardcover – 1935 by Desmond P. Murray $30.00; Longstaff, G. B. Butterfly hunting in many lands. $50.00; Forbes, W. T. M. Lepidoptera of New York and Neighboring States, Part 1. 1923 (Entomological Reprint Specialists edition), $30.00. Comstock, Butterflies of California, 1927, original paper cover torn, but the book is in excellent condition - $70.00. Guenee, Historie Naturelle des Insectes; Species General des Lepidopteres; Deltoides et Pyralites. 1854, $400.00 Brown & Heineman, Jamaica and its Butterflies, 1972, like new, $25.00. Other books, including some volumes of Moths of America North of Mexico, available – inquire for titles. Mike Toliver, 706 Lake Road, Eureka, Il 61530 (miketol@mtco.com) or Dept. Of biology, Eureka College, 300 E. College, Eureka, IL 61530; **miketol@eureka.edu.** 572

Equipment

FOR SALE: Light Traps: 12 VDC or 120 VAC with 18 inch vanes (15 & 32 Watt) and 24 inch (40 Watt). Rigid vanes of Stainless Steel, Aluminum, or Plexiglass. Rain Drains and beetle screens to protect specimens from damage.

Collecting Light: Fluorescent UV 15, 32 & 40 Watt. Units are designed with the ballast enclosed in a weather tight plastic enclosure. Mercury Vapor: 160 & 250 Watt self ballast mercury vapor with medium base mounts. 250 & 500 Watt self ballast mercury vapor with mogul base mounts. Light weight and ideal for trips out of the country.

Bait Traps: 15 inch diameter and 36 inches in height with a rain cloth top, green Lumite plastic woven screen, and supported with 3/16 inch steel rings. A plywood platform is suspended with eye bolts and S hooks. Flat bottom has a 3/16 inch thick plastic bottom that will not warp or crack. Bait container is held in place by a retainer.

Cornell Drawers: Leptraps now offers Cornell and California Academy Storage Drawers. Drawers are made of Douglas Fir, Hardboard Bottom and Glass Top. Finished in Clear Satin Gloss Varnish. A single Card Holder with Pull or two Card Holder with a Knob Pull. Foam pinning bottom is available.

For more information on any of the above, visit our web site at: **www.leptraps.com**, or contact Leroy C. Koehn, Leptraps LLC, 3000 Fairway Court, Georgetown, KY 40324-9454: Tel: 502-542-7091. 572

FOR SALE: Three ten-drawer Cornell style cabinets with drawers for sale. Drawers with glass tops and good pinning bottoms. $75 each or all three for $175. Contact: Richard S Smith, **bport.rss@gmail.com**; phone: 207-469-6234. 571

FOR SALE: 2 California Academy cabinets, each holding 24 drawers. Forty-eight California Academy drawers, with a variety of unit trays, included. Price: $2000.00. I will transport to Purdue annual meeting if buyer wants to meet there. Otherwise, shipping will be an extra charge. Mike Toliver, 706 Lake Road, Eureka, IL 61530 (miketol@mtco.com); or Dept. Of Biology, Eureka College, 300 E. College, Eureka, IL 61530; **miketol@eureka.edu**. 572

From the Editor's Desk

James K. Adams

I hope to see many of you at the Lep Soc meeting at Purdue at the end of July. May you have many hours of enjoyment with Leps between now and then!

Long-lost holotypes and other forgotten treasures in the Ralph L. Chermock collection, with biographical notes

John V. Calhoun

Ridge 977 Wicks Drivem, Palm Harbor, FL 34684 **bretcal1@verizon.net**

Ralph Lucien Chermock (1918-1977) (Fig. 1) and his older brother, Franklin (Frank) Hugo Chermock (1906-1967), described over 50 taxa of Lepidoptera between 1927 and 1963. In 1980, Frank's Lepidoptera collection of over 56,000 specimens (Fig. 13) was acquired by the Allyn Museum of Entomology (Sarasota, Florida; AME) (Anonymous 1980, Miller 1983). The holdings of the Allyn Museum were transferred in 2004 to the new McGuire Center for Lepidoptera and Biodiversity (Florida Museum of Natural History, Gainesville, Florida; MGCL). Together, the Chermock brothers coauthored several original descriptions. Frank was the senior author of nearly all those descriptions, thus it was assumed that any surviving holotypes would be preserved in his collection. However, the holotypes of *Cercyonis alope ochracea* and *Cercyonis alope carolina* were not received with the rest of Frank's material. Miller and Brown (1981) and Pelham (2008, 2014) referred only to syntypes of these taxa at AME and MGCL. I failed to find either of these holotypes during an exhaustive search of MGCL in 2014. As defined by the Code (ICZN 1999), a holotype represents the single specimen "designated or otherwise fixed as the name-bearing type of a nominal species or subspecies when the nominal taxon is established." The holotype essentially embodies the concept of a species or subspecies as perceived by its author(s). The rediscovery of "lost" holotypes is of tremendous importance.

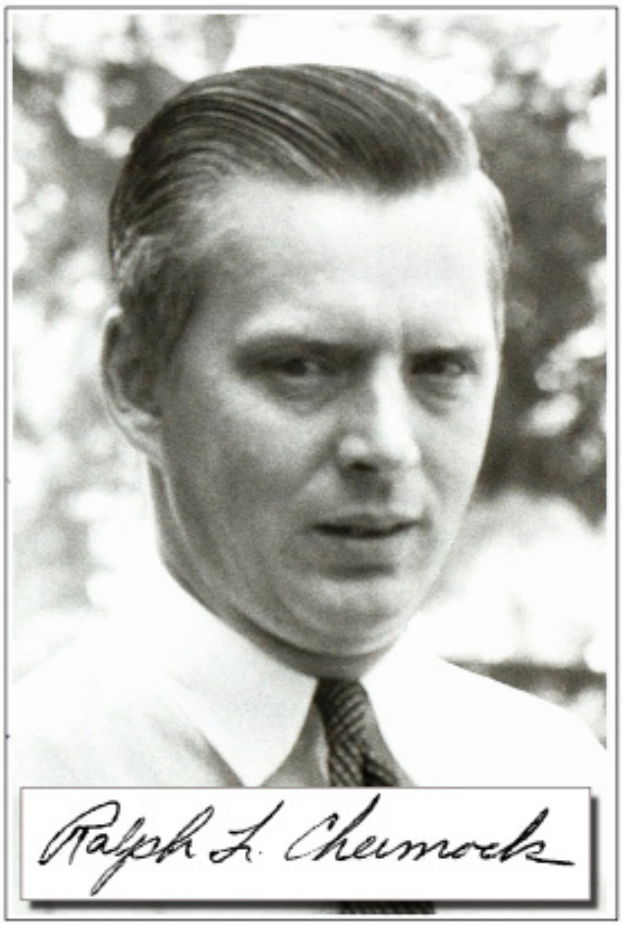


Fig. 1. Ralph L. Chermock, 1961 (courtesy UA Museums). His signature is from a document signed in 1950.

For many years, Ralph Chermock served as the director of the Alabama Museum of Natural History (UANH) at the University of Alabama. Ralph's Lepidoptera collection was bequeathed to the museum upon the death of his widow in 1992. The donation of the collection was not well publicized, thus few researchers know of its existence. Bright and Ogard (2010) and Bright et al. (2013) mentioned the collection, but access was restricted under previous museum management. Through the kind hospitality of staff members Lydia Ellington and Mary Beth Prondzinski, my wife and I visited the museum in early December 2014. Within minutes, I located the missing *Cercyonis* holotypes, which I will soon figure in a forthcoming paper. It is thought that no other lepidopterists have examined the collection since it arrived at UANH.

Estimated to comprise 30,000 specimens, Ralph Chermock's Lepidoptera collection is currently stored on the third floor of Mary Harmon Bryant Hall (formerly the Scientific Collections Building), next door to Smith Hall, where the Alabama Museum of Natural History is housed. During Ralph's tenure at UA, the collection was kept in room 318 of nearby Nott Hall, where the Department of Biology was located for many years (Anonymous 1957). Representing the largest assemblage of terrestrial insects at the university, Ralph's collection is preserved in ten steel cabinets (Figs. 2, 3) containing over 200 of his custom-made wooden drawers, which are still arranged as he had left them with specimens pinned in tight overlapping columns (Figs. 4-6). Most of the material is North American, but a sizable number of foreign species are also represented. Many of the specimens bear printed labels reading "R. L. Chermock Collection" or "Chermock Collection" (Fig. 5, inset). Two cabinets of drawers hold thousands of papered specimens awaiting preparation (Fig.7). Despite being

Figs. 2-9. The R. L. Chermock collection. 2) Collection sign. 3) Steel cabinets containing the collection. 4) Drawers in cabinets. 5) Pierid butterflies.* 6) Lycaenid butterflies,* with Chermock's printed specimen label. 7) Drawer of papered specimens. 8) Holotype and "allotype" of L. e. appalachia. 9) Holotype and "allotype" of E. r. cheneyorum. (*Courtesy UA Museums).

moved a number of times during and after Ralph's lifetime, the collection is in very good condition.

In addition to the *Cercyonis* types, Ralph's collection contains at least two other "lost" holotypes: those of *Lethe eurydice appalachia* R. Chermock (=*Lethe a. appalachia*) and *Euptychia rubricata cheneyorum* R. Chermock (=*Megisto r. cheneyorum*). Miller and Brown (1981) suggested that the holotype of *appalachia* may be in the "R. Chermock colln," but they did not specify where the collection was located (it was still in the possession of his widow at that time). They did not find the holotype of *E. r. cheneyorum*, nor did they suggest where it may be. Pelham (2008, 2014) stated that the holotype of *appalachia*

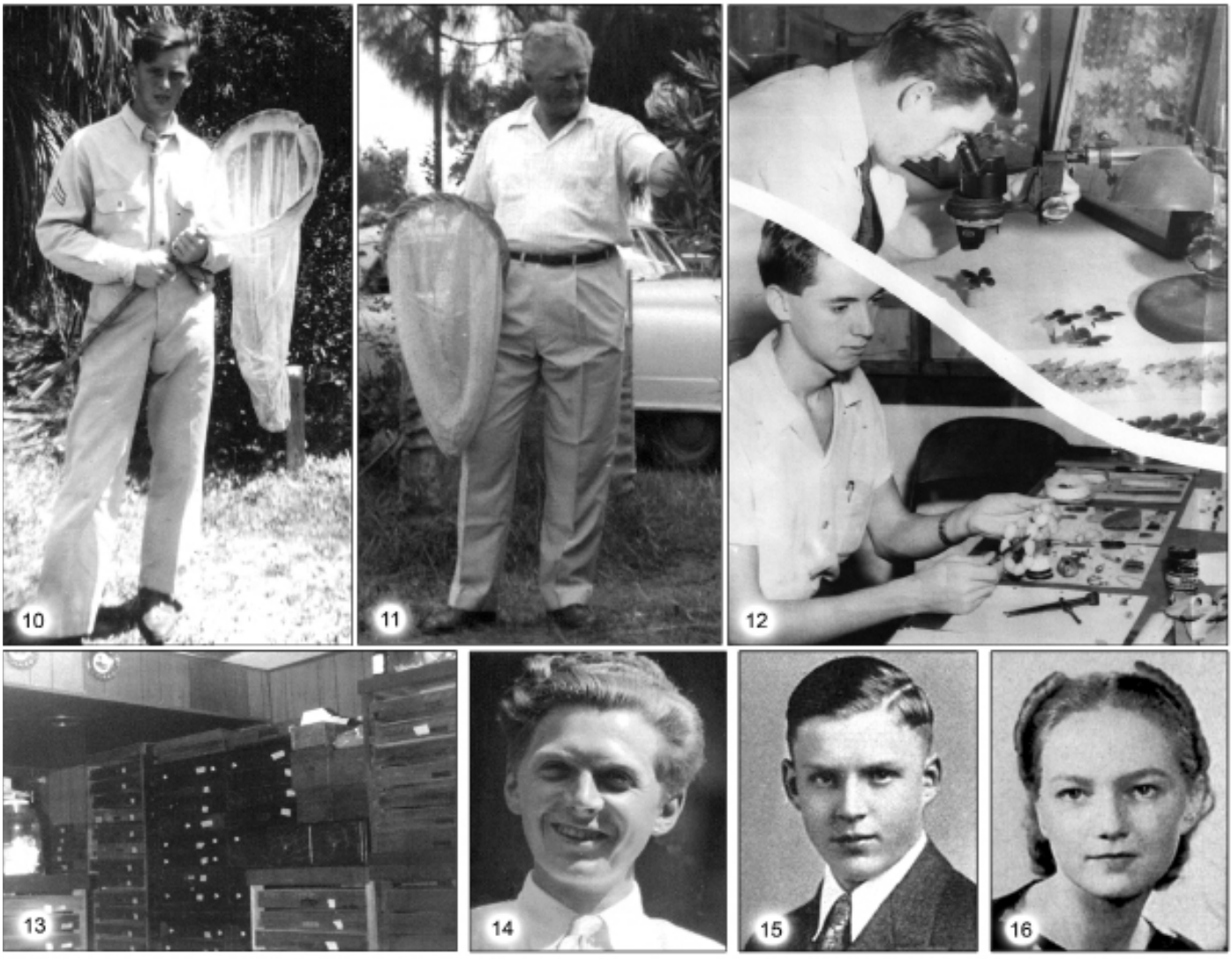
is probably at MGCL, while that of *cheneyorum* may be at Cornell University (Ithaca, New York), where Ralph received his doctorate degree (see below). The original descriptions of these taxa did not include illustrations, thus I figure the male holotypes and female "allotypes" for the first time (Figs. 8, 9). Although no other missing Chermock holotypes were found in the collection, paratypes of several Chermock taxa are present, as are a few paratypes of other taxa that Ralph received from correspondents.

Because the Chermocks described so many taxa, it is important to understand how Ralph personally arranged and interpreted specimens in his collection. Taxa are tightly grouped, often by locality, above typescript identification labels. Type specimens are denoted by colored labels: red for holotypes/paratypes and blue for topotypes. Small type labels are also affixed to the specimens themselves.

Biography of Ralph L. Chermock (1918-1977)

Masters (1968) offered a brief biography of Frank Chermock (Figs. 11, 14), but no similar account of Ralph's life was published. The following information was extracted from newspaper articles, including his obituary (Anonymous 1977), and other published sources, including Cattell (1949, 1955, 1965) and Martindell (1966, 1968). Several unpublished documents were also consulted.

Ralph L. Chermock was born 25 August 1918, in Pittsburgh, Pennsylvania, to parents Hugo Lucien Chermock (1880-1958) and Barbara H. Chermock (née Merhaut) (1885-1970). The Chermocks were relatives of the Austrian agronomist Erich von Tschermak-Seysenegg (1871-1962), who was a co-rediscoverer of Mendelian genetics (Wilson 1994). Hugo Chermock collected insects for many years (Chermock & Chermock 1940) and undoubtedly cultivated



Figs. 10-16. The Chermocks. 10) Ralph L. Chermock, April 1943, Miami Beach, FL.* 11) Franklin H. Chermock, c. 1955.* 12) R. L. Chermock: top, at UA 1954; bottom, at home c. 1936 (Courtesy UA Museums). 13) F. H. Chermock collection, c. 1975.* 14) F. H. Chermock, c. 1940.* 15) Ralph L. Chermock, 1935 (AHS 1935). 16) Ottilie D. Chermock (Cheney), 1937 (MLHS 1937). (*Courtesy L. C. Hassinger).

his sons' interest in entomology. Like his brother, Ralph became a student of natural history at a young age (Fig. 12, bottom). In 1934, he won second prize in a contest to identify mounted specimens of trees, insects, birds, and animals (Anonymous 1934). Ralph was a popular senior at Allegheny High School in Pittsburgh (Fig. 15), where he was an honor roll student, vice president of his room, a member of the yearbook staff, and "a whiz" at physical geography (AHS 1935). By 1940, Ralph's Lepidoptera collection reportedly comprised 90,000 specimens (Anonymous 1940), though this may be an exaggeration.

Ralph attended the University of Pittsburgh, earning a bachelor's degree with honors in zoology in 1939. While a senior at UP, he became engaged to Ottilie Diana Cheney (Fig. 16), who was a sophomore at the school. In 1939, Ralph received a master's degree in zoology from Duquesne University in Pittsburgh. His first paid teaching position was as a biology instructor during 1941-1942 at Beaver College in Glenside, Pennsylvania (renamed Arcadia University in 2001). In 1942, Ralph was elected as the eastern section vice-present of the Pennsylvania Academy of Science.

Ralph enlisted in the U.S. Army Air Forces (USAAF) in July 1942 and served in Miami, Florida. He was promoted to the rank of sergeant by April 1943. He and Ottilie married on 11 October 1943 and they had one child, Claudia Diane Chermock, born 16 November 1944. While stationed in Florida, Ralph could not resist the tropical surroundings and he took every opportunity to collect butterflies, even in his uniform (Fig. 10).

Following his discharge from the military in January 1946, Ralph enrolled at Cornell University, where in 1947 he received a Ph.D. with a major in entomology and a minor in vertebrate taxonomy. His dissertation, *A Generic Revision of the Liminitinae of the World*, reflected his interest in Lepidoptera and was later published (Chermock 1950). Soon after graduating from Cornell, Ralph accepted a position as an assistant professor of biology at the University of Alabama. He became an associate professor in 1951 and received full professorship in 1957. The university was proud to have such a distinguished lepidopterist on staff, boasting that he possessed the largest private collection of butterflies in North America (Anonymous 1957) (Fig. 12, top).

Ralph was a charter member of the Lepidopterists' Society, whose membership directories listed his interests as Satyridae, taxonomy, and biogeography. From 1948 to 1953 he served as the society's first southeastern zone coordinator for the annual Field Season Summary. In 1949, he agreed to serve as the satyrid section editor for a series of monographs on Nearctic butterflies to be published by the Lepidopterists' Society (Brown 1949). Unfortunately, this project was short-lived and never completed. Five years later, Ralph received a University Research Committee grant to study the distribution and classification of the butterflies of the southeastern United States (Anonymous 1954).

Shortly after joining the UA faculty in 1947, Ralph began an intensive program to study Alabama's flora and fauna. He founded and was the first curator (1947-1957) of the school's fish collection. His interest in herpetology inspired him to author the booklet *A Key to the Amphibians and Reptiles of Alabama* (Chermock 1952). Through his efforts, UANH added about 15,000 herpetological specimens, 25,000 fish, 1200 mammal skins, 300 birds, 10,000 insects, and 5000 plants (Harris 2006). Ralph established the school's herbarium and personally contributed several thousand specimens. He acted as the director of both the Marine Science Laboratory and the Tanglewood Field Laboratory, and was assistant director of the University of Alabama Arboretum. He was a part-time director of the Arts and Sciences Extension Service and served as the president of the Alabama Academy of Sciences 1955-1956. From 1959 to 1961, Ralph was a program director for the National Science Foundation. He was instrumental in adding the first conservation courses to the UA curriculum (Anonymous 1957) and was active for many years in the local Black Warrior Council of the Boy Scouts of America in Tuscaloosa. While juggling his many responsibilities, he somehow managed to make a brief trip to Costa Rica in 1961 (SSB 1968).

After serving as an honorary curator of UANH for several years, Ralph was formally appointed as its director in 1961. This position included overseeing Mound State Monument at Moundville, Alabama (Anonymous 1961). Ralph strove to modernize the museum and enhance its public appeal. He updated exhibits and introduced many new displays to its galleries, which attracted more than 100,000 visitors annually (Anonymous 1962, Brown 1962, Looser 1962).

An evolutionary entomologist, Ralph considered Ernst Mayr's *Systematics and the Origin of Species* (1942) to be a "sacred text" (Wilson 1994). With this book he introduced the concept of evolution to multitudes of students at UA. One such student would become the celebrated biologist and ecologist E. O. Wilson (1929-), who received his bachelor's and master's degrees from the school in 1949 and 1951, respectively. Wilson (1994) described the then 30-year-old Ralph as "physically impressive, an amateur boxer with a compact gymnast's body and thick arms, who occasionally performed one-arm pushups on his office floor to intimidate his followers." According to his Army records, Ralph was of average height, standing 5 feet 9 inches tall. Wilson (1994) added that Ralph was "a tense man who chain-smoked and often snorted and giggled when he laughed," and had "the disconcerting habit of listening intently to everything you had to tell him, head cocked and wearing an inviting but quizzical smile, like a psychiatrist or a skeptical job interviewer." Although Ralph professed, "You're not a real biologist until you know the names of ten thousand species" (Wilson 2006), he probably failed to personally achieve such an idealistic obligation.

Nonetheless, Ralph strongly believed in the value of field work. His students, who reverentially christened themselves "the Chermockians," traversed Alabama in search of new specimens of amphibians, reptiles, and insects (Wilson 2006). Although Ralph took every opportunity to grind his students' egos down to size, E. O. Wilson regarded him as a mentor and one of his best instructors. His teaching prowess aside, Ralph evidently did not care to have his portrait taken, even as a youth (Fig. 15). He rarely smiled in photographs and his expressions convey annoyance or utter disdain (Fig. 1).

Ralph witnessed firsthand the social and political turmoil that erupted during the 1960s at the University of Alabama (see Tilford 2014). On 11 June 1963, Alabama Governor George C. Wallace defied U.S. policy on racial integration in public schools by performing his infamous "Stand in the Schoolhouse Door" on the steps of Foster Auditorium, just a short distance south of Ralph's office in Nott Hall. Possibly motivated by continuing unrest, Ralph and his family relocated to Iowa in 1966, where he accepted a position as chairman and professor of the Department of Biology at Parsons College in Fairfield.

After a long career in academia, Ralph returned to Alabama in 1973 to head the newly established Environmental Division of the Geological Survey of Alabama, a job he held until his death. This division was responsible for gathering, analyzing, interpreting, and disseminating data on plants and animals and their environments. Not surprisingly, these activities mirror Ralph's own endeavors as a scientist.

Ralph authored and coauthored over 50 scientific papers on plants, animals, and ecology. He was a member of several honor societies, including Beta Beta Beta, Sigma Xi, Pi Tau Phi, Phi Kappa Phi, and Alpha Epsilon Delta. In addition to the Lepidopterists' Society, he was a member of the Entomological Society of Washington, Lepidoptera Research Foundation, Entomological Society of Canada, Society for the Study of Evolution, Society of Ichthyologists and Herpetologists (vice pres. in 1942), and the American Association of Museums. He was also an honorary member of the American Museum of Natural History. His interests included physiology of the central nervous system and micro-techniques in biology. An endemic Alabama fish, a rare species of salamander, and a species of beetle in Arizona are named *chermocki* in Ralph's honor.

Only 59 years old, Ralph died after an extended illness on 11 November 1977 at Druid City Hospital in Tuscaloosa. He was buried at Memory Hill Gardens, Tuscaloosa. Although Ottilie Chermock continued to keep her late husband's Lepidoptera collection at home, she welcomed anyone who wished to view his specimens. After her death, the collection was transferred to UANH, where it was received in February 1993. In recognition of Ralph's many contributions to UA, the school established the Ralph L. Chermock Prize in 1998. Awarded each year, it recognizes the most outstanding graduate student in natural history or evolutionary biology.

Ralph's tenure at UA benefited greatly from his wife's involvement. Ottilie was born in Passaic, New Jersey, on 19 May 1920. She attended Mt. Lebanon High School in an affluent suburb of Pittsburgh. She shared Ralph's interest in natural history and early on set her sights on being a museum curator (Anonymous 1938). She attended the University of Pennsylvania, but moved with her family to Tuscon, Arizona, after her sophomore year. Ottilie earned a bachelor's degree with honors in 1943 from the University of Arizona, where she served as a teaching fellow during the 1943-1944 school year (Cook 1968). She received a master's degree from the University of Alabama in 1950. From 1955 to 1966, Ottilie was employed as an associate professor of biology at Stillman College, Tuscaloosa. She and Ralph travelled widely in search of natural history specimens. Many of the plants and animals they collected are preserved at UANH. Butterflies that she collected in Arizona were given to Ralph (Chermock 1954). Ottilie authored and coauthored several articles on butterflies in the Canadian Entomologist and Lepidopterists' News. Her other interests included field biology, gardening, and reading (Cook 1968). Ottilie died on 21 November 1992 in Tuscaloosa.

Acknowledgements

I extend my deepest appreciation to Lydia Ellington and Mary Beth Prondzinski for graciously hosting my visit to UANH and providing photos and other valuable information. Frank Chermock's daughter, Linda C. Hassinger, generously shared photographs of her father and uncle. Suzanne Smailes (Wittenberg University, Springfield, Ohio) kindly helped with literature. Finally, I thank my wife, Laurel, for accompanying me to UANH and making the trip to the museum even more enjoyable.

Literature Cited

AHS [Allegheny High School]. 1935. Wahoo. Annual of the Class of June 1935. Allegheny High School, Pittsburgh, Pennsylvania. [123] pp.

Anonymous. 1934. Nature study test winners are named. Pittsburgh Post-Gazette (Pittsburgh, Pennsylvania) . 22 June:8.

_____. 1938. Pitt girl honor student wants to become curator. Pittsburgh Press (Pittsburgh, Pennsylvania). 28 Aug:6.

_____. 1940. Two brothers foremost butterfly collectors. Evening News (Harrisburg, Pennsylvania). 22 Feb:18.

_____. 1954. Distribution of butterflies. Tuscaloosa News (Tuscaloosa, Alabama). 17 Mar:12.

_____. 1957. Famed lepidopterist is on university faculty. Tuscaloosa News (Tuscaloosa, Alabama). 19 May:12.

_____. 1961. Dr. Chermock to direct Natural History Museum. Tuscaloosa News (Tuscaloosa, Alabama). 25 Oct:1.

_____. 1962. Alabama museum adds new items. Tuscaloosa News (Tuscaloosa, Alabama). 15 Apr:21.

_____. 1977. Deaths and funerals. Dr. Ralph Chermock. Tuscaloosa News (Tuscaloosa, Alabama). 15 Feb:9.

_____. 1980. Allyn Museum nets big find. Sarasota Herald-Tribune (Sarasota, Florida). 26 Oct:E1.

Bright, S. & P. H. Ogard. 2010. Butterflies of Alabama: glimpses into their lives. Univ. Alabama Pr., Tuscaloosa, Alabama. xvii+486 pp.

Bright, S., V. Charny, & W. M. Howell. 2013. Butterflies: new records for Alabama. J. Alabama Acad. Sci. 84:37-42.

Brown, E. 1962. UA Museum of Natural History takes on exotic look of Pacific's far reaches. Birmingham News (Birmingham, Alabama). 14 Oct:18.

Brown, F. M. 1949. "The Nearctic butterflies." Lepid. News. 3:13.

Cattell, J. (ed.). 1949. American men of science: a biographical directory. Eighth edition. Science Pr., Lancaster, Pennsylvania. 2836 pp.

_____. 1955. American men of science: a biographical directory. Ninth edition. Vol. II. Biological sciences. Science Pr., Lancaster, Pennsylvania. 1276 pp.

_____. 1965. American men of science: a biographical directory. The physical & biological sciences. A-C. Eleventh edition. R. R. Bowker Co., New York, New York. x+1089 pp.

Chermock, F. H. & R. L. Chermock. 1940. New melanic moths from southwestern Pennsylvania. Proc. Pennsylvania Acad. Sci. 14:138-140.

Chermock, R. L. 1950. A generic revision of the Liminitinae of the world. Amer. Midl. Nat. 43:513-569.

_____. 1952. A key to the amphibians and reptiles of Alabama. Geol. Surv. Alabama, Mus. Pap. 33:1-88.

Chermock, O. D. 1954. New records of Rhopalocera from southeastern Arizona. Lepid. Soc. News 8:25.

Cook, R. C. (ed.). 1968. Who's who in American education. 1967-68. 3 vols. Who's who in American Education, Inc., Hattiesburg, Mississippi. 962 pp.

Looser, D. 1962. At UA museum: past comes alive. Tuscaloosa News (Tuscaloosa, Alabama) 8 Sept:4.

Harris, P. 2006. UAIC personnel. Webpage: **http://uaic.as.ua.edu/Personnel.html**.

ICZN [International Commission on Zoological Nomenclature]. 1999. International code of zoological nomenclature. Fourth edition. Intl. Trust Zool. Nomen., London. xxix+306 pp.

Martindell, J. (publisher). 1966. Who's who in America: a biographical dictionary of notable living men and women. Vol. 34 (1966-67). Marquis – Who's Who Inc., Chicago, Illinois. xviii+2472 pp.

_____. 1968. Who's who in America with world notables: a biographical dictionary of notable living men and women. Vol. 35 (1968-69). Marquis – Who's Who Inc., Chicago, Illinois. 2563 pp.

Masters, J. H. 1968. In memoriam: Franklin H. Chermock 1906-1967. Bull. Assoc. Minnesota Entomol. 2:21-23.

Mayr, E. 1942. Systematics and the origin of species from the viewpoint of a zoologist. Columbia Univ. Pr., New York, New York. xiv+334 pp.

Miller, L. D. 1983. Chermock, Hovanitz and Weber collections donated to Allyn Museum. J. Lepid. Soc. 37:317-318.

Miller, L. D. & F. M. Brown. 1981. A catalogue/checklist of the butterflies of America north of Mexico. Lepid. Soc. Mem. No. 2. vii+280 pp.

MLHS [Mount Lebanon High School]. 1937. The Lebanon Log. The annual publication of the students of Mount Lebanon High School for the year 1937. Vol. VII. Mount Lebanon, Pennsylvania. 96 pp.

Pelham, J. P. 2008. A catalogue of the butterflies of the United States and Canada, with a complete bibliography of the descriptive and systematic literature. J. Res. Lepid. 40:i-xiv, 1-652.

_____. 2014. A catalogue of the butterflies of the United States and Canada, with a complete bibliography of the descriptive and systematic literature. Revised 22 June 2014. *In* Warren, A. D., K. J. Davis, E. M. Stangeland, J. P. Pelham & N. V. Grishin, Butterflies of America. Webpage: w**ww.butterfliesofamerica.com**.

SSB [Subcommittee on Systematics and Biogeography]. 1968. Indexed list of North American systematists interested in the IBP. Div. Biol Agric., Nat. Acad. Sci.-Nat. Res. Council, Washington, D.C. 422 pp.

Tilford, E. H. 2014. Turning the tide: the University of Alabama in the 1960s. Univ. Alabama Pr., Tuscaloosa, Alabama. xviii+252 pp.

Wilson, E. O. 1994. Naturalist. Island Pr., Washington, D.C. xii+380 pp.

_____. 2006. The creation: an appeal to save life on earth. W. W. Norton & Co., Inc., New York, New York. viii+192 pp.

Neominois ridingsii curicata male (left) and *N. ridingsii coloalbiterra* male (right) (Nymphalidae); see article page 86 (photo by James Scott).

Do subspecies exist?

James A. Scott, 60 Estes St., Lakewood, CO 80226-1254 **JameScott@juno.com**

Neominois ridingsii ssp. and localities figure legend: **Y**: ssp. *curicata* Gunnison Co. CO (5m top left); ssp. *coloalbiterra* Garfield Co. CO (4m1f top right), whitish var. Emery Co. UT (1m center); ssp. *stretchii* (trunk Moffat Co. CO 1m, White Pine Co. Nev. 1m, Garfield Co. CO 1m1f). **E**: ssp. *ridingsii=minimus* Blaine Co. MT (4m top of trunk); ssp. *ridingsii=neomexicanus* (Cibola Co. NM 4m top right); ssp. *pallidus* (Mono Co. CA 1m center trunk and 4m middle right); ssp. *ridingsii* 6m lower trunk (Custer Co. 1m, Chaffee Co. CO 2m, Jefferson Co. CO 3m) and 4m lower right (1m Platte Co. WY, 3m Laramie Co. WY). **S**: ssp. *wyomingo*, top to bottom Fremont Co. WY 3m, Moffat Co. CO 6m, Natrona Co. WY 5m, Douglas & Converse Cos WY 4m, Laramie Co. WY 5m.

RESURRECT THE SUBSPECIES!

A problem has appeared in Lepidoptera taxonomy. Allopatric taxa that differ very little are being named as species, rather than subspecies. This problem has taken an especially odd turn among some professional and semi-professional taxonomists, as many of them are now naming only species, and have quit naming any subspecies. If a distinctive taxon appears that is obviously just a good subspecies, they simply refuse to name it. Or if they find a distinctive allopatric taxon, they just name it as a species instead, and do not consider naming it as a subspecies. The problem here is that in nearly all cases of allopatric taxa that show little difference, there is no biological justification for preferring the naming of species rather than subspecies, so this preference for species rather than subspecies status is too often questionable. It appears that, in this time of diminishing opportunities for employment in taxonomic research, people want the glory that accrues from finding and naming distinctive new species, while they want no part of the indifference or even derision that surrounds the naming of subspecies. Science is the search for truth, so our work should be devoid of bias. So we need to discuss the problem, and devise solutions.

First, a little logic is needed here.

A hundred and fifty years of systematic and genetic research conducted since Darwin's book On the Origin of Species has proven conclusively that variation in nature is continuous: the difference between groups of individuals in a phylogenetic tree varies from zero (in the case of identical twins at birth, who later may develop a few methylation differences in some expressed genes) to just a few DNA differences, to more differences, to more and more, and still more (great differences between taxa result from extinction of intermediates). As one species evolves into two, more and more differences develop, until it becomes very difficult to determine when their genetic lineage irreversibly separates and they become distinct species (the process of actual speciation through reproductive isolation in Lepidoptera generally involves differences of pheromones [in addition to visual characteristics] that are almost never studied by lepidopterists). And research has proven that the speciation process is very messy, as newly-evolved species can still hybridize sometimes, and frequently transfer genes between "species" in the process of introgression.

Taxonomy--the naming of species and subspecies etc.—should convey information about the proper species/subspecies status of the taxa. So because the amount of difference between individuals and populations is continuous in nature, the more categories of names we apply, the better those names will apply to the small to large differences that occur between populations in nature. So, we should have superspecies, species, semispecies, subspecies, infrasubspecies, minisubspecies, etc., not just the one species category. The more categories we have, the closer the names will fit the known continuous variation of differences in nature, so using only one category (the species) represents the worst possible choice. This statement cannot be refuted, no matter what species concept one believes in. The number of justifiable categories is unlimited biologically, so only practical difficulties of assigning populations to various categories limit the number of categories to just a few (the superspecies, species, semispecies, and subspecies seem reasonable, along with various genetic and environmental "forms").

So, using this logic, it is clear that rejecting subspecies and using only species cannot be justified and is biologically ridiculous.

The trend since the time of Darwin has been relentless splitting of names in every category from the phylum and family to the genus and species, even though the organisms themselves are unchanged. Genera are split relentlessly, in animals and plants, even though there is no objective standard by which to judge how much diversity should be included in all higher categories including genera. This splitting trend continues in the species category, as many people reject practices and species concepts that could reign in the trend.

DNA is often used today to attempt to define species. But DNA—especially mtDNA—is extremely variable in numerous genera such as *Phyciodes*, *Colias*, *Oeneis*, etc.; in these genera DNA has proven to be nearly useless for defining species. This problem is so bad, that if we used only mtDNA to define species, the result would be numerous ludicrous "species" that contradict useful traits such as morphology/ecology/behavior.

Geneticists often say that a fixed percentage such as 2% or more difference in the nucleotides of DNA means that two taxa are different species. But circular reasoning can confound such a percentage quantity. As relentless splitting proceeds across all taxa, including known DNA-sequenced taxa, the differences between taxa grow less, so the amount of DNA difference suggested to confer species status of course decreases the same amount, and circular reasoning means that now less difference in DNA is used to decide species status. So the splitting continues, due to circular reasoning. And this fixed percentage difference surely differs depending on the type of DNA and the taxon studied (surely the required amount differs in various Lepidoptera depending on the biochemical/physiological value of the variable nucleotides). A ~2.8% difference in mtDNA has been found between *Papilio polyxenes* and *P. zelicaon*, which are usually treated as separate species (but were lumped in a recent book), yet in Colorado I have drawers full of apparent intermediates, and it seems likely that they maintain mostly-separate phenotypes as "species" only because the single generation of mountain *zelicaon* meshes incompletely during the summer with the multiple generations of *polyxenes*, causing lethal life cycle/diapause difficulties in many intermediates; so maybe more than 3% is required to confer species status in those *Papilio*.

Reproductive isolation is used in the biological species concept to determine species status. But there are dozens of other species concepts, and many persons—even some mostly-professional taxonomists—now flatly reject the use of reproductive isolation. And reproductive isolation is rarely studied, because pheromones that control mating in most Lepidoptera are almost never determined (even though head-space gas chromatography used to determine floral scents can now be used to determine pheromones of individual males and females), so usually only cases of sympatry without interbreeding supply evidence of reproductive isolation to taxonomists (some people give species status to sympatric allochronic taxa, which is ridiculous as the taxa cannot meet so there is zero evidence of reproductive isolation, only synchronic sympatry can provide such evidence—note that *N. r. wyomingo* in the **S** in the figure overlaps other ssp. by 500 miles but flies three months later).

An ICZN name is supposed to contain useful evidence of relationships. The genus can tell us where its species belong in the phylogeny of its family. If a taxon is named as a subspecies, we know that it is related to the other subspecies in the species. But when every small variation is raised to genus status or species status, the names cease to carry those clues about phylogenetic relationships. Raising a subspecies to species rank means we can't tell by its name that it is close to some other species. Splitting a genus means we can no longer determine by its name which other genera it is close to (this is especially annoying in many recent books that arrange all the genera alphabetically, making similar genera very difficult to find). Ultimately, when a genus is split so much that only one species remains in the genus (such as *Agraulis vanillae* which should be placed in *Dione*), the species name becomes useless as only the genus name is needed to uniquely name the taxon and the species name is no longer needed—essentially the nomenclature has become mononomial, even though ICZN nomenclature is supposed to be binomial.

The naming of subspecies has become a lower-status enterprise because of frequent naming of weak or worthless subspecies. In the early 1900s, numerous aberrations were given names by many people, most prolifically by Jean D. Gunder who named hundreds that he called "transition forms". That excess of naming led by midcentury to a

general taboo on the naming of aberrations. Similar excess occurred in European butterflies about the same time, when for instance ~200 subspecies names were given to *Parnassius apollo*, which led to a definite slowdown in the naming of subspecies (nowadays it has become popular in Europe to raise subspecies to dubious species status, in such taxa as *Hipparchia* etc.).

Subspecies are actually necessary to use in genera such as *Argynnis* (*Speyeria*) and *Heliconius*, in which parallel variation/convergence is rampant between species (due to transfer of genes by introgression or viruses or *Wohlbachia* in *Argynnis*, and due to Mullerian mimicry and occasional hybridization in *Heliconius*), which makes the wing pattern differences between subspecies often greater than the difference between sympatric species. In these genera it is necessary to meticulously study and describe the butterflies at every point in their range, just to be able to distinguish the species from each other.

Subspecies also seem useful in various genera that have defied mtDNA analysis and still require meticulous study, such as *Phyciodes*, *Colias*, *Oeneis*, and *Euphilotes*.

And the U.S. federal government considers subspecies to be available for designation of threatened or endangered status, which gives the naming of subspecies at least an occasional measure of respect.

As we have seen, numerous taxa seem to be given species status merely because the naming of species is considered a higher-status activity than the naming of subspecies. Additionally, various authors want to treat their studied taxon as a species rather than subspecies in order to attract more conservation money. Such bias is wrong, because science is the relentless search for unbiased truth.

In conclusion, we must restore the subspecies—as well as the superspecies and semispecies--to respectable status, because the subspecies category is not prohibited by any correct biological logic, and is helpful and frequently necessary to properly study geographic variation and speciation. But to improve its status, we must consistently perform several actions, not just one:

First, if two taxa are allopatric and differ little, name them as subspecies, not as species. Rather than raising every small variation to species status or genus status, show us that you know how to deduce phylogenetic relationships and are able to communicate those relationships with the ICZN names you apply. If two similar taxa are allochronic, or hybrid populations fly between generations of one of the parent taxa, then they are most probably subspecies, because allochrony is NOT reproductive isolation. If two taxa intergrade then they would seem to be subspecies, no matter how different their DNA. If a "species" is not able to retain its genes which spread widely into the other taxon, then one must consider the high probability that they are just subspecies.

Second, to return the subspecies concept to respectable status, we must synonymize the hundreds of weak and worthless subspecies that litter the checklists, and keep only the justifiable subspecies. Whack all the worthless names into synonymy! If you can't assign a subspecies name to some population without looking at locality labels, synonymize it! If the subspecies isn't distinctive enough to be noticeable by the ordinary person in a reasonably small series, whack it!—that is the subspecies concept that has been used in the past for butterflies, and is the only one that is practical today considering that nearly all butterfly workers are amateurs. I won't list many examples here, to avoid getting bogged down in details of individual cases; research continues, which may alter taxonomic status, for instance in N. A. butterflies I have proven many "species" are just subspecies (*leonardus* includes *pawnee*, *gracilis* includes *zephyrus*, *gryneus* includes *siva* & *nelsoni* etc., *leanira* includes *fulvia*, *pyracmon* includes *henshawi*, etc.), various "forms" are really species (*humulus*, *nigrozephyrus*, *altacordillera*), and various "subspecies" are really species (*florus*, *Anthocharis julia*, *dione*). Progress marches on, and we must not overlook the subspecies category when assigning a taxonomic status to each name (and we must not overlook the superspecies or semispecies categories). It is obvious that numerous names of "subspecies" in the checklists are worthless. Three "subspecies" names in the Pelham catalogue (Pelham, 2008) are just individual aberrations, at least a hundred more are just synonyms, and numerous "species" are just subspecies. My Biological Catalogue of North American Butterflies (Scott 2008) attempted to properly list the species and subspecies status of those names, and attempted to include some of the continuous variation of differences between taxa into the checklist by using superspecies and semispecies categories as well as species and subspecies, and by nesting some subspecies under other subspecies to show smaller differences and apparent phylogenetic relationships.

So there is much work to be done. Bring back the subspecies!

Literature Cited

Pelham, Jonathan P. 2008. A catalogue of the butterflies of the U.S. and Canada, with a complete bibliography of the descriptive and systematic literature. Journal of Research on the Lepidoptera 40:I-XIV+1-659.

Scott, James A. 2008. Biological catalogue of North American butterflies. Papilio (New Series) #20:1-51. For free pdf go to http://digitool.library.colostate.edu click on Colorado State University, search for Papilio (New Series).

Editor's Note: While I agree with James Scott's assertion that subspecies have a strong utility, I disagree with the statement that allochrony is NOT reproductive isolation. If truly allochronic, then BY DEFINITION the populations are reproductively isolated from one another, and potentially on their way to, if not already at, a speciation event.

Park City, Utah 63rd Lep Soc meeting -- butterfly field trips

Compiled by Ranger Steve (Mueller)

Ody Brook Enterprise, 13010 Northland Drive, Cedar Springs, MI 49319 **odybrook@chartermi.net**

91 butterfly species were sighted on field trips in northern Utah during the 63rd Lepidopterists Society Meeting held at Park City Utah. Outings were in northern Utah with one field trip to central Utah (Table). Locations were Chepeta Lake –Uinta Mountains (A), Wasatch State Park (B), Guardsman Pass (C), Murdock and Bald Mountains (D), Mirror Lake (E), Bountiful Peak (F) and Otter Creek/ Koosharem (G). Like always, field trips provided opportunities for lepidopterists to share knowledge and experiences. Both observation and collecting opportunities were available.

Thank you field trip leaders: Ben Cieslak, Ed Gage, Tony Jones, Bob Mower, John Richards, Kilian Roever, Sara Ryndfleisz, Todd Stout, Mark Walker, and Wayne Whaley.

Common Name	**Species**	A	B	C	D	E	F	G
Date -- July 13-20		13-Jul	13-Jul	13-Jul	14-Jul	14-Jul	15-Jul	20-Jul
Papilionidae (6 species)								
Western Tiger Swallowtail	*Papilio rutulus*			X	X		X	
Two-tailed Swallowtail	*Papilio multicaudata*						X-Lower El	
Anise Swallowtail	*Papilio zelicaon nitra*	X			X		X	
Indra Swallowtail	*Papilio indra*						X	
Clodius Parnassian	*Parnassius clodius*			X			X	
Smintheus Parnassian	*Parnassius smintheus sayii*	X			X			
Pieridae (13 Species)								
Cabbage White	*Pieris rapae*	X					X-Lower El	X
Margined White	*Pieris marginalis*			X				
Checkered White	*Pontia protodice*	X			X		X	
Western White	*Pontia occidentalis*	X	X		X		X	
Pine White	*Neophasia menapia*							X
Large Marble	*Euchloe ausonides*				X			
Southern Rocky Mountain Orangetip	*Anthocharis julia*				X			
Clouded Sulphur	*Colias philodice*		X	X	X	X	X	
Orange Sulphur	*Colias eurytheme*						X	
Queen Alexandra's Sulphur	*Colias alexandra*							X
Western Sulphur	*Colias occidentalis*				X			
Scudder's Sulphur	*Colias scudderi*	X			X			
Mead's Sulphur	*Colias meadi*	X						
Lycaenidae (22 species)								
Edith's Copper	*Lycaena editha*				X			
Purplish Copper	*Lycaena helloides*		X		X			
Ruddy Copper	*Lycaena rubidus*		X					
Blue Copper	*Lycaena heteronea*		X		X		?	

Common Name	**Species**	A	B	C	D	E	F	G
Bronze Copper	*Lycaena hyllus*							X
Liliac-bordered Copper	*Lycaena nivalis*		X	X	X			
California Hairstreak	*Satyrium californica*				X		X	
Sylvan Hairstreak	*Satyrium sylvinus*				X			X
Coral Hairstreak	*Satyrium titus*		X					
Hedgerow Hairstreak	*Satyrium saepium*						X	
Behr's Hairstreak	*Satyrium behri*				X			X
Colorado Hairstreak	*Hypaurotis crysalus*							X
Western Green Hairstreak	*Callophrys affinus*			X				
Thicket Hairstreak	*Mitoura (Callophyrs) spinetorum*				X			
Silvery Blue	*Glaucopysche lygdamus*			X			X	
Arrowhead Blue	*Glaucopysche piasus*		X					
Lupine Blue	*Plebejus lupinus*		X	X			X	
Melissa Blue	*Plebejus melissa*	X						
Boisduval's Blue	*Plebejus icarioides*			X	X		X	X
Greenish Blue	*Plebejus saepiolus*	X	X			?		
Arctic Blue	*Plebejus glandon rustica*	X	X					
Ancilla Dotted Blue	*Euphilotes enoptes ancilla*		X	X	X		X	
Nymphalidae (36 species)								
Variegated Fritillary	*Euptoieta claudia*							X
Morman Fritillary	*Speyeria mormonia*	X	X	X				
Great Basin Fritillary	*Speyeria egleis*			X			X	
Callippe Fritillary	*Speyeria callippe*						X	
Zerene Fritillary	*Speyeria zerene*			X			X	
Nokomis Fritilliary	*Speyeria nokomis apacheana*							X
Northwestern Fritillary	*Speyeria hesperis*		X					X
Relict Fritillary	*Boloria kreimhild*	X						
Freija Fritillary	*Boloria freija*	X						
Purplish Fritillary	*Boloria montanus*				X			
Arctic Fritillary	*Boloria chariclea*	X						
Field Crescent	*Phyciodes pulchella*		X					X
Mylitta Crescent	*Phyciodes mylitta*	X	X					
Rockslide Checkerspot	*Chlosyne damoetas*	X						
Northern Checkerspot	*Chlosyne palla*		X					
Variable Checkerspot	*Euphydryas anicia alena*	X						
Sagebrush Checkerspot	*Chlosyne acastus*		?					
Hoary Comma	*Polygonia gracilis zephyrus*	X		X	?			

Common Name	**Species**	A	B	C	D	E	F	G
California Tortoiseshell	*Nymphalis californica*	X		X	X	X	X	
Milbert's Tortoiseshell	*Nymphalis milberti*	X			X			X
Painted Lady	*Vanessa cardui*	X	X		X			
Weidemeyer's Admiral	*Limenitis weidemeyerii*	X	X	X			X	
Monarch	*Danaus plexippus*						X-Lower El	
Canyonland Satyr	*Cyllopsis pertepida*							X
Common Wood Nymph	*Cercyonis pegala*							X
Great Basin Wood Nymph	*Cercyonis sthenele*							X
Mead's Wood Nymph	*Cercyonis meadi*							X
Small Wood Nymph	*Cercyonis oetus*	X						X
Common Ringlet	*Coenonymph tullia ochracea*	X	X	X				
Colorado Alpine	*Erebia callias*	X						
Magdalena Alpine	*Erebia magdalena*	X			X			
Chryxus Arctic	*Oeneis chryxus*	X				X		
Uhler's Arctic	*Oeneis uhleri*							
Macoun's Arctic	*Oeneis macounii*	X						
Jutta Arctic	*Oeneis jutta*	X						
White-veined Arctic	*Oeneis bore*	X						
Hesperiidae (14 species)								
Northern Cloudywing	*Thorybes pylades*		X					
Mexican Cloudywing	*Thorybes mexicana*		X	X				
Dreamy Duskywing	*Erynnis icelus*	X						
Persius Duskywing	*Erynnis persius*						X	
Rocky Mountain Duskywing	*Erynnis telemachus*		X				X	
Common Checkered Skipper	*Pyrgus communis*							X
Grizzled Skipper	*Pyrgus centaureae*	X			X			
Two-banded Checkered Skipper	*Pyrgus ruralis*	X						
Russet Skipperling	*Piruna pirus*		X					
European Skipper	*Thymelicus lineola*	X	X					
Garita Skipperling	*Oarisma garita*		X					
Western Branded Skipper	*Hesperia colorado*							X
Draco Skipper	*Polites draco*	X		X				
Sonoran Skipper	*Polites sonora*		X					
91 Species Total								

Conservation Matters: Contributions from the Conservation Committee

The imperiled Mardon Skipper Butterfly: an initial conservation success

Scott Hoffman Black, The Xerces Society for Invertebrate Conservation, Portland, OR **sblack@xerces.org**

I have been working to conserve species and landscapes for over 25 years. Of course, the best things about my job are the success stories. Not only do they help me to keep my chin up, but are vital to maintain public support for conservation. One recent example of "good news" for butterflies comes from the Pacific Northwest, where a diminutive butterfly, the Mardon Skipper (*Polites mardon*) (Fig. 1), is now protected throughout most of its range.

Fig. 1. Mardon skipper (*Polites mardon klamathensis*) Photo by Rich Hatfield.

What sets conservation of this butterfly apart from other efforts is the unprecedented level of cooperation between agencies, universities and nonprofits. The Mardon Skipper Working Group drew together the Xerces Society for Invertebrate Conservation, the Forest Service/Bureau of Land Management Interagency Special Status/Sensitive Species Program (ISSSSP), Washington Department of Fish and Wildlife, Washington State University, the Oregon Zoo, the Six Rivers National Forest, and the Center for Natural Lands Management.

Although people have worked on this species for a number of years, what really got conservation efforts moving was when the skipper *was listed as a candidate species under the U.S. Endangered Species Act in 2000. The threat of listing led many agencies to step forward.*

The first task was to understand the range of the butterfly and identify as many extant sites as possible. As is true of most rare butterflies, we knew little about the Mardon Skipper when we started out. Surveys had not been done across the species range, we had little information on its life history, and we did not have a handle on the site-specific threats.

The Mardon Skipper was first described in 1881 by W. H. Edwards from specimens probably taken near Tenino, Thurston County, Washington, by H. K. Morrison (Dornfeld 1980). E. J. Newcomer discovered the butterfly to be common on Signal Peak in the Cascades of Yakima County (Pyle, 1974). These were the only known populations until 1979, when Sterling and Eileen Mattoon discovered a population on High Divide Ridge in Del Norte County, California, 350 miles south of previous locations. A decade later John Hinchliff found specimens from southern Oregon in collections at the American Museum of Natural History. A population was found in Jackson County, Oregon, in 1990 by John Vernon and Mike Richard, with three more added the following year by Sterling Mattoon and others working on the Xerces Society Fourth of July Butterfly Count for the Mount Ashland area (Mattoon et al. 1998). Extensive surveys completed between 1999 and 2012 increased the number of known occupied sites from 14 to 165. Despite the relatively large number of occupied sites, many are small with only a few butterflies.

The Mardon Skipper is now known from four geographic areas (Fig. 2):

- southern Puget Sound in Washington
- the east slope of the Cascade Mountains in southern Washington
- the Cascade Mountains in southern Oregon, and
- Del Norte (north-coastal) California and the southern coast of Oregon

Species life history revealed

Knowing the life history of the Mardon Skipper was vital to conserving it, but the details were poorly understood. For instance, the common wisdom was that Mardon larvae fed mostly on fescue. This was refuted by studies that showed female Mardon Skippers oviposit on multiple graminoid species, indicating that the larvae may be generalists (Beyer and Schultz 2010)—although they do exhibit plant specificity within localities. In the Washington Cascades, females prefer to oviposit on sedges (*Carex* spp.) at one location and oatgrass (*Danthonia* spp.) at another. Yet, when present, Idaho Fescue (*Festuca idahoensis* Elmer) is generally preferred (Beyer and Schultz 2010). In the Puget Sound prairies, the Mardon Skipper greatly prefers Roemer's fescue (*Festuca idahoensis* Elmer ssp. *roemeri* (Pavlick) S. Aiken) (Henry and Schultz 2012). At the two sites studied in Oregon, California oatgrass (*Danthonia californica* Bol.) was the most frequently utilized oviposition plant (Beyer and Black 2007). Variables such as

Fig.2. Range-wide map of Mardon Skipper distribution

Fig. 3. Mardon Skipper (*Polites mardon klamathensis*) larva in fescue. Photograph by Loni Beyer.

graminoid structure, the surrounding plant structure, and tree shading also influence oviposition behavior (Henry and Schultz 2012).

It was also widely believed that the Mardon Skipper overwintered as pupae (Potter et al. 1999; Dornfeld 1980; Newcomer 1966 in Potter et al. 1999), but preliminary studies of flagged Mardon Skipper larvae in the field by Beyer and Black (2007, see Fig. 3) suggest that Cascade populations overwinter as larva.

Threats to mardon sites

One additional benefit to all of the surveys was that we were able to document threats at Mardon Skipper sites, including overgrazing by domestic livestock; conifer and shrub encroachment; off road vehicle use; prescribed and natural fire; recreation (including camping); applications of *Btk* (*Bacillus thuringiensis* var. *kurstaki*); climate change; and issues related to small population size and stochastic events.

One of the major threats is the loss of meadow habitats to conifer encroachment (Fig. 4), which has occurred throughout the Mardon Skipper range. Because of limited dispersal abilities, and an increase in distance between suitable habitat due to encroaching conifers, Mardon Skippers face a reduced probability of recolonization in the event of a local extirpation and the potential that they will exist as isolated remnant populations.

Complicating this is that prescribed fire used to deal with encroachment has been shown to extirpate some butterfly populations. A study in California showed substantially fewer Mardon Skippers in the burned areas of meadows compared to unburned areas one, two, three, and five years following the burn event (Black et al. 2014). When transect data was pooled within years, both burning and time had a significant effect on Mardon Skipper abundance. The fact that there is no interaction effect between time and burning suggests that the effect of burning on Mardon Skippers is real and not confounded by annual variation in butterfly populations (Black et al. 2014). One solution for

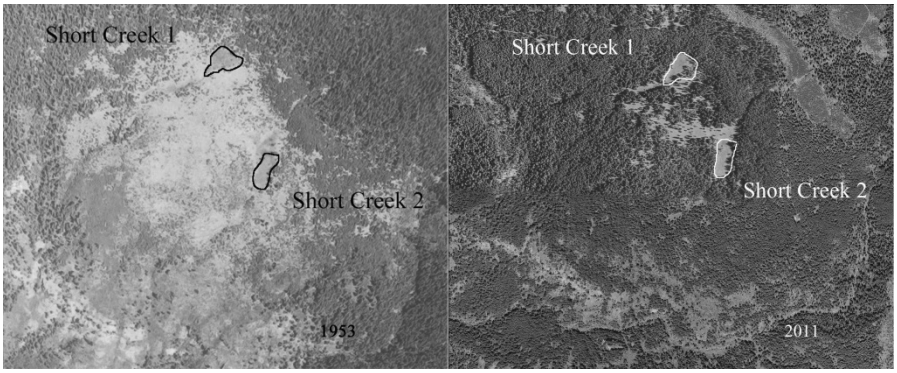


Fig.4. Example of forest encroachment from aerial photographs of the Short Creek Complex on the Rogue River – Siskiyou National Forest in southern Oregon comparing 1953 and 2011.

the Mardon Skipper has been to hand cut conifers and remove them out of the most densely occupied areas.

Information into action

The great thing about this partnership is that as information was gathered, it was put it into action. Because we had a range of partners with different strengths we were able to better understand the science and management needs, and most importantly, put this management into practice. Because we had a better understanding of the Mardon locations and its habitat needs we were able to work with the Forest Service and BLM to develop site specific management plans. These plans address overgrazing, off-road vehicles, conifer encroachment, invasive weed encroachment, and improve the meadow habitat upon which the skippers depend. There is also monitoring at key sentinel sites to track population numbers of the Mardon Skipper.

These 15 years of effort were cited as one reason the Fish and Wildlife Service did not list this butterfly, and the Mardon Skipper working group was recognized for this conservation success through the U.S. Forest Service 2012 Wings Across the Americas Butterfly Award. This process serves as a model that could be replicated toward the conservation of additional U.S. butterfly species, and potentially applied to additional animal groups.

References

Beyer L, Black SH (2007) Site Utilization by Adults and Larvae of Mardon skipper Butterfly (Polites mardon) at four sites in Washington and Oregon

Beyer LJ, Schultz CB (2010) Oviposition selection by a rare grass skipper *Polites mardon* in montane habitats: Advancing ecological understanding to develop conservation strategies. *Biol Cons* 143:862–872

Black S, Fallon C, Hatfield R, Mazzacano C (2014) Controlled Burning and Mardon Skipper: Summary of Mardon Skipper Coon Mountain Burn Site Occupancy Study Data from 2009 to 2013. Report to the U.S. Forest Service, Oregon Zoo, and U.S. Fish and Wildlife Service. 29 pp.

Dornfeld J (1980) *Butterflies of Oregon*. 276 pp. Forest Grove, Oregon, Timber Press.

Henry EH, Schultz CB (2012) A first step towards successful conservation: Understanding local oviposition site selection of an imperiled butterfly, Mardon Skipper. *J Insect Conserv* 17:183–194

Mattoon S, Emmel J, Emmel T (1998) The distribution of *Polites mardon* (Lepidoptera: Hesperiidae) in North America, and description of a new subspecies from southern Oregon. Systematics of Western North American Butterflies. Mariposa Press, Gainesville, Florida 878:767–774

Pyle, RM (1974) *Watching Washington Butterflies*. 109 pp. Seattle, Seattle Audubon Society.

Irving Finkelstein at Doerun Pitcherplant Bog NA, Colquitt Co.

Fernaldella georgiana Covell, Finkelstein and Towers, at Handy Kenedy Rd. Ohoopee Dunes site, 1 mile north of Hwy. 152, Tattnall Co., Georgia, April.

www.lepsoc.org and https://www.facebook.com/lepsoc

Metamorphosis

Chris Grinter

Irving L. Finkelstein (1936 – 2015): Irving Finkelstein, of Atlanta Georgia, passed away at 8:25 a.m. on February 26, 2015, at the age of 78, in the company of longtime friend Sandra Davis. Irving was born June 18, 1936 to Nathan and Pauline Finkelstein, and spent his childhood days in Brooklyn and Queens in NYC. Irving indicated that his fascination with Lepidoptera started at age seven, when he enjoyed collecting saturniid cocoons from the trees along the streets of NYC. Irving obtained his undergraduate degree in advertising design from Pratt Institute, and worked what he called an excruciating three years in New York art studios and ad agencies. He eagerly went back to school to get his M.A. and Ph.D. (1968) degrees in Art History at New York University, after which he taught for a year at Brandeis University, three years at Southern Methodist University, and the final 25 years (1971 – 1996) of his career at Georgia State University in Atlanta.

Irving joined the Lepidopterists' Society in 1972 and attended the charter meeting of the Southern Lepidopterists' Society (SLS) in 1978. He served as the secretary for the SLS from 2002 – 2007, and in 2003 won the John Abbot award from the SLS for his contributions to southeastern Lepidoptera studies.

From the first SLS meeting on, he vividly recalled meeting many lepidopterists with like minds which reinforced his strong love for butterflies. In 1980, Irving started participating in trips to the tropics led by Tom Emmel, and enjoyed collecting in Peru, Ecuador, Brazil, French Guiana, Costa Rica, Guatemala, and Belize. He independently visited other neotropical locations several times. He also exchanged specimens with collectors from Spain, France, Israel, Japan and elsewhere, building a collection of many 1000's of specimens over the course of 36 years. He had an insatiable appetite for building his collection.

In August of 1990, I had the good fortune of first meeting Irving while searching for Diana Fritillaries in the Cooper's Creek area of north Georgia. Through the 90's we collected butterflies together in many locations in Georgia, and gradually I infected Irving with a love of moths. After his retirement in 1996, Irving devoted the last two decades of his life to learning of the moths of Georgia, and he and I travelled to and trapped moths in many locations. His identification skills grew very rapidly in the late 1990's, and he easily helped me identify large trap samples for our quarterly reports to the SLS News. Interestingly, prior to his intense interest in moths, Irving discovered in 1981 a lovely day-flying geometrid moth (*Fernaldella georgiana*) at the Ohoopee Dunes, a unique Georgian habitat 90 miles inland from the coast, that he and Charlie Covell then described (Jour. Res. on the Lepid. 23, 2: 161-168 [1984]). This moth to this day is found only in a four county area in Georgia. Irving also frequented the north Georgia mountains, and collected many good records for the state, including the only two specimens of Georgia's only Ghost Moth, *Sthenopis auratus*.

Irving had been diagnosed with Crohn's disease relatively early in his life, and had managed his condition reasonably well for decades. In Feb. 2009, Irving was further diagnosed with multiple myeloma, which was treated aggressively. Despite this, Irving continued travelling and collecting moths, including a trip to Kansas and Colorado in May of 2012. Irving was active collecting into 2014, still spreading specimens as late as December of 2014.

His large collection was donated to the McGuire Center in Gainesville, Florida just weeks prior to his death (News of the Lep. Soc. 57:1, 42-43, covers [2015]). I sent him a prepublication copy of the article about his donation which he saw and very much appreciated just five days before his death. Irving indicated that if you wish to do something in memoriam for him, please make a donation to the International Myeloma Foundation at **www.myeloma.org**. *[contributed by James Adams and Sandra Davis; see pictures previous page]*

Andrei Sourakov sent me the following touching comments in an e-mail after the staff of the McGuire Center had picked up Irving's collection from his home in Atlanta:

"When Irving gave up his collection, he was not in physical pain, thanks to the medicine. When it was loaded onto the truck, he calmly wished them a safe journey. I have been accused of many things, but sentimentality is not one of them. Yet, Irving touched my heart profoundly with his frail appearance and superhuman strength. When Andy Warren, Tom Emmel and I visited him three weeks ago, he entertained us with stories of his childhood, offered us refreshments, and enquired as to our comfort. All of this as he was dying of cancer and had only a few weeks to live.

It looked to me as though his collection was the expression of his artistic nature that perhaps did not materialize in his art. In fact, his collection, in my view, represents an unrivaled form of art yet to be discovered by art critics. It has everything that a great piece of art should have: depth, perception, historical and modern relevance, immortal beauty, and personality. It is premeditated, researched and executed with meticulousness, precision and love. While teaching art history for a living, Irving seems to have invested a good part of his soul into his collection and the associated explorations. He may have found his true calling, but perhaps we should be thankful that he has not become a professional entomologist. The forbidden fruit is often sweeter, and perhaps his catches, his pursuits, and his entomological art are so aesthetically pleasing to the eye and so important to him because he was not relying on it to earn him a living." *[printed with permission from Andrei Sourakov]*

Metamorphosis: *(continued from p. 95)*

Dave Hyatt of Tucson, AZ passed away in January. He was particularly interested in Saturniidae and was a life member since 1985.

William S. Rolfe: Renowned American flower and nature artist William ("Bill") Stuart Rolfe passed away at 78 years on March 12, 2015 in Vista California.

He is survived by committed companion Peg Kessler (Encinitas CA), daughter Heather Patton with grandsons Jacob and Andrew Patton (Escondido CA), daughter Vanessa H. Rolfe (Lake Worth, FL); sister Sarah Hadeler (Rancho Santa Fe, CA) and brother Raymond J. Rolfe (Greenlawn, NY).

A man as unique as the original art he created, Bill perfected the preservation of plants in acrylic embedments so that the natural beauty was able to be appreciated for years. He had a lifelong passion and devotion for nature and science, and particularly loved studying butterflies and mushrooms. One of his specialties was to embed an arrangement of natural elements to detail what might be found on a forest floor but he also featured single flowers.

He has joined an exclusive list of those artists chosen to best embody American art at the United Nations gift store; and his work has been seen in the White House.

He started his company, W Rolfe LTD in Huntngton NY in the 1950's and moved it to Aquebogue, NY in 1971. In 1984 he moved to Escondido, CA. Member of the Lepidopterists' Society since 1988. *[Information received from an obituary run by the family of William Rolfe]*

Announcements: *(continued from p. 69)*

Corrections to items in the Spring 2015 News (vol. 57:1)

James Scott provides corrected/added identifications of photos in the article by George Krizek, News of the Lep Soc 37:1, 44-48: P. 44, right middle: *Colias scudderi* (*gigantea*) *harroweri*; p. 45, top left: *Speyeria mormonia*; p. 45, top right: *Speyeria coronis*; p. 45, left middle: *Speyeria zerene*; p. 46, right, 3rd down: *Euphydryas anicia*; p. 47, left lowest: *Oeneis calais altacordillera*; p. 47, right lowest: *Cercyonis oetus*.

James Scott, **JameScott@juno.com**

Brochures

If anyone is in need of some of the new Membership Brochures to hand out at various functions, please contact Julian P. Donahue (**julian@lepsoc.net**) and he will be glad to help you out.

Angel Lake, East Humboldt Mountains, to the SW of Wells, Elko Co., Nevada. Just 12 road miles to the SW of Wells, Angel Lake is at 8400' and has a lepidopterous fauna very different from the surrounding lower dry scrub. (Photo by James K. Adams)

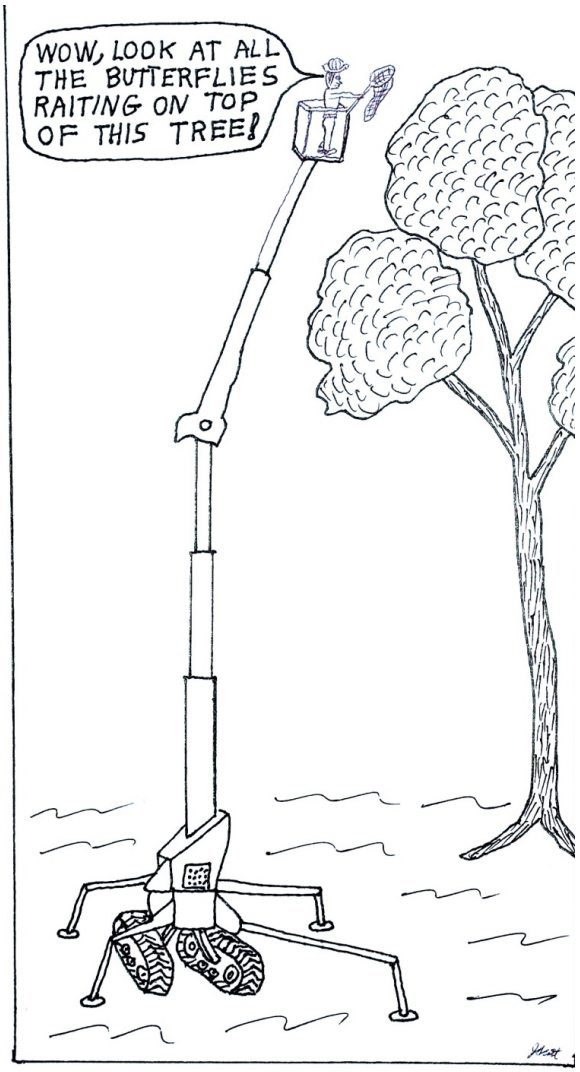
DR. BOB'S ARBOREAL ADVENTURE

James A. Scott, 60 Estes St., Lakewood, CO 80226-1254 **JameScott@juno.com**

*The Teupen Canopy Hylift uses hydraulic pistons to raise the cage up to 86 feet, and the cage can be extended up to 40 feet horizontally without falling because of four outrigger supports and its heavy weight of 9,080 lbs. It crawls on two caterpillar tracks. See www.Teupen.info, Teupen@SherillTree.com, or SherrillTree.com/Teupen.

Raiting = "perch to await females for mate-location" (see Scott, J. 2010. New terminology for describing mate-locating behavior of butterflies (and moths), with examples in Colorado. News of the Lepidopterists' Society 52(2):58-62).

Concerning poles and swinging objects on ropes: James Scott was great at Tetherball in elementary school, because he had two good arms--the other kids had only one.



Membership

The Lepidopterists' Society is open to membership from anyone interested in any aspect of lepidopterology. The only criterion for membership is that you appreciate butterflies and/or moths! To become a member, please send full dues for the current year, together with your current mailing address and a note about your particular areas of interest in Lepidoptera, to:

Kelly Richers, Treasurer
The Lepidopterists' Society
9417 Carvalho Court
Bakersfield, CA 93311

Dues Rate

Active (regular)	$ 45.00
Affiliate (same address)	10.00
Student	20.00
Sustaining	60.00
(outside U.S., for above add 5$ for Mexico/Canada, and 10$ elsewhere)	
Life	1800.00
Institutional Subscription	60.00
Air Mail Postage, **News** ($30.00 outside North America)	15.00

Students must send proof of enrollment. Please add $5.00 to your dues if you live in Canada/Mexico, $10.00 for any other country outside the U.S. to cover additional mailing costs. Remittances must be in U.S. dollars, payable to "The Lepidopterists' Society". All members receive the **Journal** and the **News** (each published quarterly). Supplements included in the News are the Membership Directory, published in even-numbered years, and the Season Summary, published annually. Additional information on membership and other aspects of the Society can be obtained from the Secretary (see address inside back cover).

Change of Address?

Please send permanent changes of address, telephone numbers, areas of interest, or e-mail addresses to:

Chris Grinter, Assistant Secretary
Illinois Natural History Survey
1816 S. Oak Street, Champaign,
IL 61820-0904; cell: 847-767-9688
cgrinter@gmail.com

Our Mailing List?

Contact Chris Grinter for information on mailing list rental.

Missed or Defective Issue?

Requests for missed or defective issues should be directed to: Chris Grinter, Illinois Natural History Survey, 1816 S. Oak Street, Champaign, IL 61820-0904; cell: 847-767-9688; ***cgrinter@gmail.com***. Please be certain that you've really missed an issue by waiting for a subsequent issue to arrive.

Memoirs

Requests for Memoirs of the Society should be sent to Publications Manager, Ken Bliss (address opposite).

Submissions of potential new Memoirs should be sent to:

Kelly M. Richers
9417 Carvalho Court
Bakersfield, CA 93311
(661) 665-1993 (home)
kerichers@wuesd.org

Journal of The Lepidopterists' Society

Send inquiries to:

Keith Summerville
(see address opposite)
ksummerville@drake.edu

Book Reviews

Send book reviews or new book release announcments to either of the following (do NOT send new books):

James K. Adams
(see address opposite)
jadams@daltonstate.edu

Carol A. Butler
60 West 13th Street
New York, NY 10011
cabutler1@verizon.net

WebMaster

Todd Gilligan, Colorado State Univ., Bioagricultural Sciences and Pest Management, 1177 Campus Delivery, Fort Collins, CO 80523-1177
(970)490-4478
tgilliga@gmail.com

Submission Guidelines for the News

Submissions are always welcome! Preference is given to articles written for a non-technical but knowledgable audience, illustrated and succinct (under 1,000 words, but will take larger). Please submit in one of the following formats (in order of preference):

1. Electronically transmitted file and graphics—in some acceptable format—via e-mail.

2. Article (and graphics) on diskette, CD or thumb drive in any of the popular formats/platforms. Indicate what format(s) your disk/article/graphics are in, and call or email if in doubt. The InDesign software can handle most common wordprocessing software and numerous photo/graphics software. Media will be returned on request.

3. Color and B+W graphics should be good quality photos suitable for scanning or, as indicated above, preferably electronic files in TIFF or JPEG format at least 1200 x 1500 pixels for interior use, 1800 x 2100 for covers.

4. Typed copy, double-spaced suitable for scanning and optical character recognition. Original artwork/maps should be line drawings in pen and ink or good, clean photocopies. Color originals are preferred.

Submission Deadlines

Material for Volume 57 must reach the Editor by the following dates:

Issue		Date Due
57	3 Fall	Aug. 15, 2015
	4 Winter	Nov. 15, 2015
58	1 Spring	Feb. 15, 2016
	2 Summer	May 20, 2016

Reports for Supplement S1, the Season Summary, must reach the respective Zone Coordinator (see most recent Season Summary for your Zone) by Dec. 15. See inside back cover (facing page) for Zone Coordinator information.

Executive Council

President

Todd Gilligan
Colorado State University
Bioagricultural Sciences
and Pest Management, 1177
Campus Delivery, Fort
Collins, CO 80523-1177
(970)490-4478
tgilliga@gmail.com

Past President

Andrew Warren
McGuire Center for
Lepidoptera & Biodiversity
Florida Museum of Natural
History, P.O. Box 112710
Gainesville, FL 32611-2710
(352)273-2015
andy@butterfliesofamerica.com

Vice Presidents

Todd Stout (1st VP)
1456 North General Drive
Salt Lake City, UT 84116-
4306, (801)438-3602
todd_stout29@hotmail.com

Mirna Casagrande
Departamento de Zoologia
Universidade Federal do
Parana, Caixa Postal 19020
81531-980 Curitiba, Parana
BRAZIL 41 3361-1569
mibras@ufpr.br

Delano Lewis, Director
Office of Research & Grants
Dept. of Bio., Chem., and
Environmental Science
Northern Caribbean Univ.
Mandeville, Jamaica, W.I.
1-(876)963-7744
delano.lewis@ncu.edu.jm

Secretary

Michael Toliver, Division of
Math and Science, Eureka
College, 300 E. College Ave.
Eureka, IL 61530-1500
miketol@eureka.edu

Assistant Secretary

Chris Grinter, Illinois Natu-
ral History Survey, 1816 S.
Oak Street, Champaign, IL
61820-0904; 847-767-9688
cgrinter@gmail.com

Treasurer

Kelly M. Richers
9417 Carvalho Court
Bakersfield, CA 93311
(661) 665-1993 (home)
kerichers@wuesd.org

Assistant Treasurer

Julian P. Donahue
735 Rome Drive, Los Angeles,
CA 90065-4040. Phone (323)
227-1285, FAX (323) 227-0595
Julian@lepsoc.net

Publications Manager

Kenneth R. Bliss
1321 Huntington Trail
Round Rock, TX 78664-9316
(512)850-1700
krbliss@gmail.com

Editor, News of The Lepidopterists' Society

James K. Adams
School of Sciences and Math
Dalton State College
650 College Drive
Dalton, Georgia 30720
(706)272-4427
jadams@daltonstate.edu

Editor, Journal of The Lepidopterists' Society

Keith Summerville
Dept. of Environmental
Science and Policy, 131 Olin
Hall, Drake University
Des Moines, IA 50311-4505
(515)271-2265
ksummerville@drake.edu

Editor, Memoirs of The Lepidopterists' Society

Kelly Richers
(see Treasurer, above)

WebMaster

John A. Snyder
(see WebMaster opposite)

Members-At-Large

Megan McCarty, Kathleen
Prudic, Mark Walker,
Carol Butler, Michael
Collins, Jennifer Zaspel
John Calhoun, Wayne
Wehling, Robert Dirig

Season Summary Zone Coordinators

Refer to Season Summary for Zone coverage details.

Chief Season Summary Coordinator and Editor

Leroy C. Koehn
3000 Fairway Court
Georgetown, KY 40324
(502) 370-4259
leptraps@aol.com

Zone 1, The Far North:

OPEN: If you have ANY interest in being the Zone Coordinator for this region, please contact Leroy Koehn as soon as possible!! See contact information above.

Zone 2, The Pacific Northwest:

Jon H. Shepard
4925 SW Dakota Ave.
Corvallis, OR 97333
(541) 207-3450
shep.lep@netidea.com

Zone 3, The Southwest:

Ken Davenport
8417 Rosewood Avenue
Bakersfield, CA 93306
(661) 366-3074 (home)
kdavenport93306@yahoo.com
with help on moths from Kelly Richers (see Treasurer, this page)

Zone 4, The Rocky Mountains:

Chuck Harp
8834 W. Quarto Ave.
Littleton, CO 80128-4269
(720) 981-5946
cehmoth@aol.com

Zone 5, The Plains:

OPEN: If you have ANY interest in being the Zone Coordinator for this region, please contact Leroy Koehn as soon as possible!! See contact information above.

Zone 6, Texas:

Charles Bordelon
Texas Lepidoptera Survey
8517 Burkhart Road
Houston, TX 77055
texaslepsurvey@sbcglobal.net

Zone 7, Ontario and Quebec:

Maxim Larrivee
Collections entomologiques
et recheche, Insectarium de
Montréal/Espace pour la vie
4581, rue Sherbrooke E.
Montréal, Québec
Canada H1X 2B2
(514) 872-0474, ***maxim.lar-rivee@ville.montreal.qc.ca***

Zone 8, The Midwest:

OPEN: If you have ANY interest in being the Zone Coordinator for this region, please contact Leroy Koehn as soon as possible!! See contact information above.

Zone 9, The Southeast:

Brian G. Scholtens
Biology Department
College of Charleston
66 College Street
Charleston SC 29424-0001
(803) 856-0186
scholtensb@cofc.edu

Zone 10, The Northeast:

Mark J. Mello
c/o Lloyd Center,
430 Potomska Rd
Dartsmouth, MA 02748
markmello@lloydcenter.org

Zone 11, Mexico & the Caribbean:

Isabel Vargas Fernandez
Museo de Zoologia,
Facultad de Ciencias,
Univ. Nacional Autonoma
Mexico, Apartado Postal 70-
399, D.F., Mexico 04510
ivf@ciencias.unam.mx

Gynandromorphs and aberrants from the collection of Alex Bic

(photos by Alex Bic)

Morpho rhetenor cacica, Peru: Satipo, Rio Shanqui, Dec., 2013

Parides sesotris, Peru: Cuzco, Sept., 2003

Catonephele numilia, Costa Rica: El Bosque Nuevo, May, 2014

Ornithoptera priamus, Indonesia: Aru Island, June, 2014

Callicore pygas cyllene, Peru: Junin, Satipo 750m, June, 2013

Papilio zagreus, Peru: Cuzco, Chontochaca, June, 2013