NEWS OF THE LEPIDOPTERISTS' SOCIETY

Volume 66, Number 3 Fall 2024

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. . . and more!

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Grape Root Borer, *Vitacea polistiformis*, Lexington Wildlife Management Area, Cleveland County, Oklahoma, 29 June 2020. Image by Bryan Reynolds.

Indian Blanket (*Gaillardia*) for the dubious gardener

Gary Noel Ross

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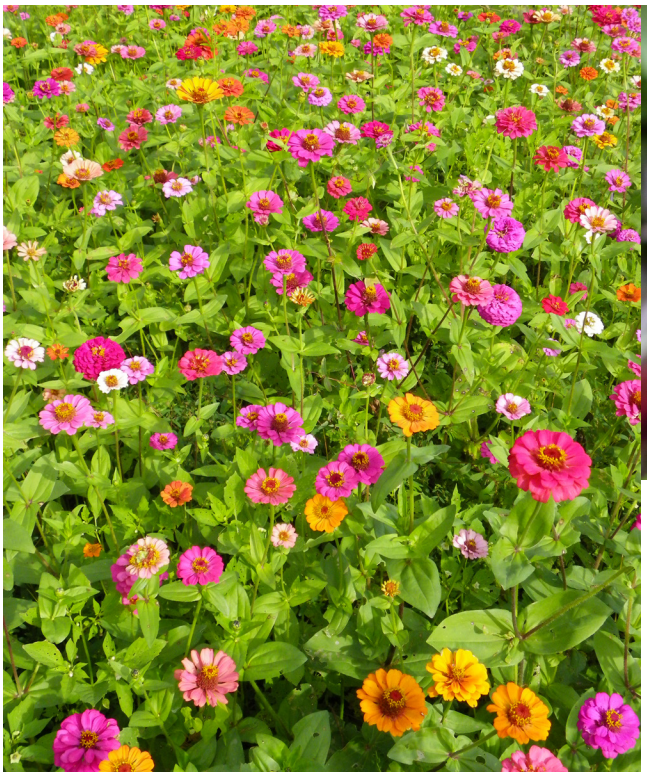
For me, aging is not "just a number." I began gardening for butterflies and other pollinators at my home in south Louisiana back in 1994. Covering approximately 1000 square feet, the extensive planting is positioned in front of my residence so that I can share the view with neighbors. The design is compartmentalized into five distinct "beds" to maximize diversification and accessibility. Over the years, I have relied on seasonal ephemerals to provide mass. And two plantings were required: one in October for a late winter/spring season bloom, the other in late April for an early summer/fall season bloom. The payoffs have been extraordinary, in some years, a "head-turner" for passersby.

As an octogenarian, time has taken its toll on me, lamentably. Planting, weeding, watering, often conducted in unavoidable high heat and high humidity, have evolved from hours of pleasure to "ticktock minutes" of sheer drudgery. I have been forced to become concerned for my health. To tackle the challenge, I decided to rethink the plant composition in my flower beds. I switched from seasonal short-term annuals to annuals that have lengthy blooming periods and that reseed naturally. However, I did continue to maintain a few low-maintenance perennials albeit punctuated with seasonal annuals for dramatic color. In theory, the rearrangement should cut back on maintenance, and therefore, lessen my physical stress.

For an annual reseeding species to serve as a garden core, I introduced a plant bearing the endearing monikers breadstick poppy, common garden poppy, and opium poppy. All reference the exotic and narcotic-laden *Papaver somniferum*, a hardy, time-proven species that the United States Drug Enforcement Administration allows residential gardeners to cultivate in limited quantity. The three to four-foot-tall plants never failed to produce displays that were extraordinarily elegant and glamorous. The flowers, furthermore, were irresistible to honey bees and bumblebees (not butterflies because the flowers produce no nectar only pollen). Having recently emerged from their winter torpor, the bees quickly discovered that the poppies endowed with abundant pollen-laden anthers were a convenient source of nutrition at a time when most native spring blossoms were in short supply. As lagniappe, the poppy seeds were prodigious—thousands per capsule—with germination nearly 100 percent the following autumn. My troubles were over, at least, so I thought.

Yet, despite their flamboyancy, the poppies proved a point of contention. You see, in the Deep South, opium poppies are heat sensitive/cold tolerant. Consequently, seeds must be sown, or seedlings planted in late October through early November. Flowering occurs in late March/early April. However, each blossom lasts for only two to three days. And although each plant can produce upwards of a dozen flowers, the plant has only a lifespan of no more than two to three weeks. After, the plants quickly turn yellow and die. And removal requires labor—not an easy task for a senior with compromised abilities.

Left: Flower bed, opium poppy, Spring 2021. Right: Bumble bee collecting pollen in single petal form of poppy.



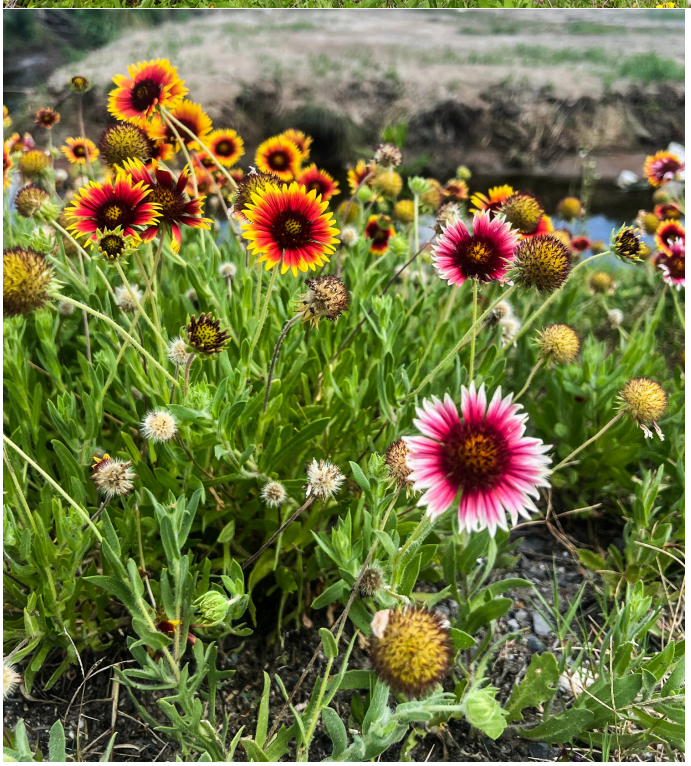
Left: Mass of tall zinnias in a flower bed. Summer 2021. Above: Gulf fritillary (*Dione incarnata*) on Zinnia.

For hot weather annuals I selected garden zinnias. They, too, proved excellent bloomers, attracting a variety of pollinators, including butterflies. But as fall progressed, many of the plants were attacked by a powdery mildew that hindered blooming. So, once again, I was faced with high maintenance in contrary weather.

Not easily dissuaded, I enlisted a native known as Indian blanket, firewheel, or simply, blanket flower—technically, *Gaillardia pulchella*. Classified within the family Asteraceae (formerly, Compositae or "composites/sunflower" family), Indian blanket can be found throughout much of the continental United States and northern Mexico (USDA Hardiness Zones 2-11); additionally, the species has been introduced successfully to Alaska, Hawaii, and eastern Canada. As tribute, the species is the official state wildflower of Oklahoma.

G. pulchella is characterized as vigorous. Plants grow rapidly throughout the entire warm season provided the habitat is drenched in sunlight. There seemingly is no preference for soil type provided it is not soggy. For example, plants thrive in salty, alkaline, acidic, and even the nutrient poor sands of ancient beach ridges (cheniers) and modern beaches along the Gulf coast. The only restriction

Left: Mass of Indian blanket in a flower bed adjacent to the sidewalk. Summer 2022. Right: Border bed with planting at neighbor's house. Above left: Typical flower. Above right: Flower variant.



Left above: Natural habitat on a chenier in Cameron Parish, LA. Yellow blooms are *Coreopsis lanceolata*. June 2016. Above: Natural habitat, sandy beach, Grand Island, LA. Left: Close up, Sandy beach, Grand Island, LA. Last two photos, June 2024, Gregory P. Grizzaffi.

seems to entail good drainage. The foliage of *Gaillardia* is grayish light green, dense, and highly variable in morphology. Branching is common although the overall shape remains mound-like. Plants are floriferous, with new blooms appearing throughout the warm season. Each daisy-like flower head is made up of both outer ray and inner disk components. And each head is displayed at the tips of long stems that emerge above the foliage. Flowers are downright snazzy! The flamboyant colors are arranged in whorls, grading distally from arresting hues of light yellow and gold, through orange, red, maroon, and lastly lush purple for the spiky central disks. Some botanists have suggested that the common names might be traced back to early settlers of the American Southwest who (1) were reminded of traditional blankets handwoven by many Native Americans, (2) were reminded of a burning hoop/ring, or (3) the unrivaled propensity of the plants once established to produce myriad seedlings that quickly spread to cover the ground far and wide—like a "blanket." Regardless, all explanations are appropriate. [The generic name, *Gaillardia*, honors an eighteenth-century French magistrate who was an enthusiastic botanist, and the specific epithet, *pulchella*, is derived from Latin, translated as "beautiful."]

And for wildlife savvy gardeners, there is more. The flowers and seed pods of Indian blanket are documented to attract bees, birds, and butterflies. From past observations in the Texas Hill Country, I can vouch that the plant is frequently visited, especially by bees of all persuasions and songbirds/doves; butterflies seemed to be only casual callers—and these were mainly small grass skippers. Regardless, published literature notes that *G. pulchella* is the host for at least one moth: *Schinia volupia*—the painted schinia moth, aka Indian blanket flower moth. The taxon is in the large family Noctuidae (owlet moths), subfamily Heliothinae (flower moths). However, the related but smaller *S. bina* (Bina flower moth) and the butterfly, bordered patch (*Chlosyne lacinia*), have both been reliably cited to exploit *Gaillardia* as a host, too. Meanwhile, authors Opler and Krizek (1984) report that *Gaillardia* is an important nectar source for the very rare

Top left: The seed head of a flower.Clockwise from top center: Orange Sulphur (*Colias eurytheme*; photo # 26874389), Checkered White (*Pontia protodice*; photo # 23030149, Pimmimemon), Variegated Fritillary (*Euptoieta claudia*; photo # 47899670, Thenatureguy) and Buckeye (*Junonia coenia*; photo # 30005724) -- all photo numbers refer to the website Dreamstime.com.

Dakota skipper (*Hesperia docotae*). I personally logged in the following, although only in small numbers: checkered white (*Pontia protodice*), variegated fritillary (*Euptoieta claudia*), pearl crescent (*Phyciodes tharos*), American lady (*Vanessa virginiensis*), red admiral (*Vanessa atalanta*), common buckeye (*Junonia coenia*), silver-spotted skipper (*Epargyreus clarus*), long-tailed skipper (*Urbanus proteus*), Horace's duskywing (*Erynnis horatius*), common checkered skipper (*Burnsius communis*), fiery skipper (*Hylephila phyleus*), and ocola skipper (*Panoquina ocola*).

S. volupia is itself very attractive. In fact, although sporting a wingspan of just under an inch (20-22 mm), the moth is an excellent mimic of the telltale colors of Indian blanket. The illusion is further enhanced by the moth's behavior: adults habitually rest during daylight hours atop the *Gaillardia* flower heads. There, they are difficult to distinguish, and therefore, uncannily protected from anything—or anyone—in pursuit. The color match is a "picture of contentment," and often cited as a textbook example of camouflage or "cryptic coloration."

Schinia painted moth (*Schinia volupia*), Tennessee Colony, Anderson Co. TX, May 24 .2024. Photo: Arthur V. Evans.

I began my pairing with *Gaillardia* by acquiring three small adult transplants from a friend in April 2021. I first pruned each plant to within three to four inches of its roots. Then, after three weeks of adjusting, the plants began to sprout new leaves. That began a growth period that did not cease until the first freeze of December with each flower remaining fresh for upwards of two weeks. For the entire

growing season, I was graced by what one poet described as "the essence of a sunset." During every Easter season, Indian blanket in nexus with Texas bluebonnet (*Lupinus subcarnosus*) and entireleaf Indian paintbrush (*Castilleja indivisa*) decorate fields and roadsides into a kaleidoscope of color. No wonder the founders of Texas State University in San Marcos (located in the "Texas Hill Country" and the epicenter in Texas for *Gaillardia*), settled on gold and maroon to represent the school's official colors. Absolutely!

Throughout the long growing season—regardless of temperature or rainfall—the *Gaillardia* plants did not show any signs of stress. Near the first of the new year (when the plants had dried and the seed heads turned grayish white), I pulled the plants. To my surprise the root system was not deep as I had suspected based on the plants' tolerance for drought. Instead, roots were shallow and fibrous—easy to pull. Before discarding, I first shook each plant to release as many seeds as possible from the three to four dozen usually lodged in each head.

The following spring, 2022, the prolific nature of *Gaillardia* was manifested. Seedlings "blanketed" my entire garden! Over the weeks, however, self-culling occurred enabling a few specimens to establish dominance. By mid-summer, the garden was ablaze with flowers once again. Yes, I did have to spend some time weeding earlier on. But once the plants achieved some size, they created shadows that functioned as a ground mulch so that weed germination was minimal.

The year 2023 provided the quintessential test for my *Gaillardia*. Turns out, 2023 was the hottest and driest on record for Baton Rouge. Unprecedented! A massive high pressure dome stabilized over the state in March, creating ideal conditions for heating and drying. Throughout the summer and autumn, Baton Rouge logged 32 days with maximum temperatures of 100 degrees F or higher (topping out at 106), breaking the standing record of 28 days in 1921. In concert with the heat, rainfall was virtually non-existent -- very unusual for a state in which summer thunderstorms are typical; by year's end Baton Rouge registered 51.40 inches (average: 60.65). The National Weather Service classified the city and most of the entire state to be within an "Exceptional Drought" -- the highest level possible. The conditions devastated even many aged common trees such as southern magnolia and slash pine. Weather became the topic of most conversations.

I seized the unique opportunity to experiment. For the entire climatic anomaly, I didn't water. Understandably, many of my "old reliables" throughout my landscape gradually began to wilt and brown; several even died. Each day my home turf began to resemble more and more that of a xeriscape. Even my 50-year-old prize *Azalea indica* plants met their "coup de gras." But not *Gaillardia* in my pollinator gardens! Even those plants that had sprouted from wayward seeds

Right: Mature plants in space between stepping stones in patio of a neighbor. May 2024. Below: Seedlings sprouting in gravel between stepping stones in a walkway bisecting two flower beds. Summer 2024. Below right: Maturing seedlings in spaces between concrete slabs of a driveway. May 2024.

Volunteer patch of Gaillardia in a residential street-side lawn. Homeowner spares the plants during routine grass mowing. Seed source was the nearby insular flower bed. July 2024.

fallen between crevasses in pavement or loose gravel within my driveway/walkways matured to produce their own seeds; however, height was diminished, leaf color a bit pale, and fewer flowers. Furthermore, seeds that had taken hold in adjacent manicured grassy areas (lawns, for instance) flourished, and if not mowed, matured as well. Patently, *Gaillardia* is a quintessential candidate for a xeriscape—or possibly a physically challenged gardener.

I did notice, though, one difference during the 2023 drought. Typical weeds did not show any signs of stress, and in fact, seemed to proliferate more rapidly. Perhaps the physiologically stressed *Gaillardia* plants were not dense enough to create sufficient shade to function as a natural mulch? Perhaps.

But despite the inclement weather, *Gaillardia* remained a prolific seed producer. During early spring 2024, my garden was once again verdant with young plants from self-sown seeds in 2023. The only negative trait for me is that seeds germinate easily within but a modicum of soil (as stated previously). As such, the species can invade extra-garden arenas. But the maverick plants are easy to remove. For me, the trade-off has been worth every moment. And although I have yet to observe a painted schinia moth, I take solace. After all, I am a new convert to gardening with Indian blanket.

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I am especially grateful to F. Randy Wright and Randy Lanctot (both of (Baton Rouge, LA) for permitting me access to their residential landscapes; Gregory Paul Grizzaffi (Baton Rouge) for providing photographs from Grand Isle, LA.; and Arthur V. Evans (Richmond, VA) for contributing a photo of *Schinia volupia* resting atop a *Gaillardia* flower head.

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(*Continued on page 123*)

A history of the Ely collection and early Lepidopterists' Society networking: part 3

Caitlin LaBar

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Previously, I reviewed Ely family connections to lepidopterists in Wisconsin, Maine, New Hampshire, and Latin America. In part 3, I cover their connections to lepidopterists in the western United States.

The Elys went on at least two collecting trips to Colorado: 27 Jun–11 Jul 1953 and ca. 26 Jun–16 Jul 1954 (Moundville 1953, Ely 1954), with at least the 1953 trip including part of Wyoming and specifically mentioning a visit to Colorado Springs and looking for fossils in South Dakota. Only twelve specimens from the 1953 trip are in the Ely Collection: ten from Colorado and two from southern Wyoming. There are no specimens from the 1954 trip. **Frederick Martin "Brownie" Brown (24 Mar 1903–30 May 1993)**, a well-known lepidopterist from Colorado Springs, CO, advertised specimens for sale collected by William Clark-Macintyre in Ecuador and Juan Foerster in Argentina and Paraguay (Notices by members 1950b, 1950c, 1950d), and collected in Ecuador and Yucatan himself (Crago 2007). Brown was also a geologist and paleoentomologist, so it is highly likely that he was one of Rachel's many correspondents. Some of the unlabeled South American specimens might have come from him, and potentially some of the random Colorado specimens. One of Rachel's specimens from the 1953 trip is *Euphydryas anicia capella* with "paratype" written on the label in Rachel's handwriting (Fig. 1). This subspecies was described in 1897, so the specimen is not a paratype, but Brown was later involved with clarifying the type locality (Miller & Brown 1981) as the vicinity of Manitou Springs, El Paso County, Colorado, leading me to speculate that Rachel confused topotype with paratype and that Brown may have led her to that locality. Another ten specimens from Colorado are dated 1947 and 1952, most of which are labeled with the county, which is almost never given for specimens Rachel collected herself. Two of these, dated 9 and 16 Jul 1952 from Evergreen and Morrison, respectively, in Jefferson County, CO, align with six records (22 Jun, 16-19 Jul) in the Milwaukee Public Museum (MPM) that have no collector given but are from the same area. Arthur Moeck frequently collected in Wyoming and Colorado and was in the area during this time, so these are likely from him, and potentially the *E. a. capella* specimen as well. Brown almost never collected in Jefferson County and Don Eff, a LepSoc member from Boulder, was not in that area at that time according to his collecting notebook (Warren pers. comm. 2023). Eff hosted numerous lepidopterists during their visits to Colorado and always noted who accompanied him in the field, but apparently did not know the Elys as they are not mentioned in his notes during the 1953 and 1954 trip dates (Warren pers. comm. 2023).

Fig. 1. *Euphydryas anicia capella* from Colorado, 30 Jun 1953. "Paratype" is believed to have been confused with topotype, most likely collected at the type locality during the Ely's 1953 Colorado trip.

Fig. 2. *Chlosyne palla* from Snake River Canyon, Wyoming, 3 Jul 1948 in the Ely Collection, likely collected by Arthur Moeck.

One Wyoming specimen is almost certainly from Moeck: *Chlosyne palla* from Snake River Canyon, Teton County on 3 Jul 1948 (Fig. 2). Several specimens in MPM were collected by Moeck in Wyoming between 29 Jun–3 Jul 1948, including a few from "Snake River Canyon" on 3 July. Of the remaining Wyoming Ely specimens, two are from Story on 21 and 23 Aug 1952 by an unknown collector and ten are from Story and the Big Horn Mountains between 18–25 Aug 1953. Three of the latter, two *Speyeria cybele* and one *S. hydaspe*, match the same date and location as a record from the Bohart Museum: a *S. aphrodite* from 20 Aug 1953, Story, Sheridan County, WY by J. R. Mori, indicating that he is the most likely collector of those ten Ely specimens.

James R. "Jim" Mori is not listed in any of the early Lep Soc directories but is mentioned in the acknowledgements of two articles on California butterflies (White & Singer 1974, Davenport 1983). A search of his name in SCAN turned up dozens of records under J. R. Mori, J. Mori, J.

Fig. 3 (left). *Speyeria coronis semiramis* and *Phyciodes mylitta* in the Ely Collection, which share the same date as *S. coronis* specimens in the Bohart Museum from Barton Flats, San Bernardino County, collected by Jim Mori. **Fig. 4** (right). *Zerene eurydice* specimens from 11 Jul 1953, possibly collected by William A. Hammer.

(Jim) Mori, and James R. Mori, mostly from California but at least four from Mexico, three from Alaska, two from Arizona and the one record mentioned from Wyoming. One of his California records is from "Silverado Canyon, Santa Ana Mountains" on 20 Jun 1953, eight days before a record in MPM with the same location but no collector name. Further, two Ely specimens from "San Bernardino Mtns, 7500'" on 30 Jun 1953, *Speyeria coronis* and *Phyciodes mylitta* (Fig. 3), share the same date as three *S. coronis* specimens in the Bohart Museum from "Barton Flats, San Bernardino Co.", two of which give no collector name but the other lists J. R. Mori. Another record in SCAN for Silverado Canyon on 20 Jun 1953 is stated to be from J. (John) Cooper, who, like Mori, is not listed as a LepSoc member during that period. However, considering the potential connection of Mori to two California and at least three Wyoming specimens in the Ely Collection, it is most likely that he is the collector of those specimens and possibly some of the others from California as well.

Another possible collector of Ely specimens is **William A. Hammer**. Two specimens of *Zerene eurydice* collected 11 Jul 1953, from Camp Angeles and "San Bernardino Mts", San Bernardino County (Fig. 4), match a SCAN record of *Colias harfordii* from Camp Angeles on 11 Jul 1953 in the San Diego Natural History Museum collected by Hammer. This location also happens to be only a few miles west of Barton Flats along Route 38 in the San Bernardino Mountains, where some of the potential Mori specimens were collected. Hammer was a charter member of LepSoc, living in San Leandro, CA, and seems to have been a rather prolific collector and trader; there are over 700 records in SCAN under his name in six museums. Incidentally, seven of the records are from Peru between 1939–1964, including one from "8-10-52", assumed to be 10 Aug 1952. One Ely specimen from Peru is dated "10/52". While this could simply be a coincidence, it is possible that it may also be from Hammer.

Fig. 5. *Colias harfordii* collected by Walter H. Freeman.

The only Ely specimen from California with a collector's name on the label is a *Colias harfordii* collected by **Walter H. Freeman** on 3 Jul 1954 from Wheeler Springs, Ventura County (Fig. 5). Freeman first appears in LepSoc directories in 1954, living in Camarillo, CA (List of members 1954). A likely match from the 1950 census is Walter Harley Freeman (24 Feb 1914–18 Nov 1979), born in Hazelton, ID and listed as a teacher for a private high school in Camarillo.

The remaining 27 Ely specimens from California include seven undated specimens, two from Inyo County on 7 Jul 1937, and the rest dated between 1951–1953 and almost all from Orange, Riverside, and San Bernardino counties. The locations are generic and include Lemon Heights, Ladd Canyon, Silverado Canyon, Santa Anita Canyon, Santa Ana Mountains, Cleveland National Forest, and San Bernardino Mountains. Some of these labels are in the same style and handwriting as the probable Mori specimens. The dates are spread across several months and overlap with Wisconsin dates, so it seems they were all obtained through purchase or exchange, rather than the Elys collecting in California themselves. Two *Polygonia satyrus* from 14 Jul 1951 have no location other than "California". The date matches two specimens in SCAN: a moth from Kennedy Meadows, Tuolumne County by C. A. Downing, who is not listed as a LepSoc member from that time, and an *Agraulis vanillae* from El Cajon, San Diego County by Fred T. Thorne, who was a charter member of LepSoc (List of Members 1947). With only a date to go on, I cannot be certain which, if either, of these two are the collector of the two Ely specimens.

Table 1. Washington and Oregon specimens in the Ely Collection.

Species	Date	Location	State	Collector
Polites sabuleti alkaliensis	25 Jul 1951	Burns, Harney Co.	OR	Ray Albright (?)
Neophasia menapia tau	12 Aug 1952	"Ore."	OR	Ray Albright (?)
Pterourus rutulus	2 Jul 1955	Salem, Marion Co.	OR	Ray Albright (?)
Coenonympha california	5 Sep 1957	Dayton, Yamhill Co.	OR	Ray Albright
Speyeria zerene gloriosa	22 Jul 1958	O'Brien, Josephine Co.	OR	Ray Albright
Parnassius clodius claudianus	9 Jul 1956	Mt. St. Helens, Skamania Co.	WA	Ray Albright
Euphydryas anicia hopfingeri	26 May 1955	Brewster, Okanogan Co.	WA	John C. Hopfinger
Oeneis nevadensis nevadensis	23 Jul 1951	"Wash." [taken 1 day prior to Henriksen specimen from Sunnyside, Yakima Co.]	WA	Emily Henriksen (?)
Catocala irene	Aug 1951	"Wash." [likely Yakima Co.]	WA	Emily Henriksen (?)
Heliopetes ericetorum	1951	"Wash." [likely Yakima Co.]	WA	Emily Henriksen (?)
Limenitis lorquini	1951	"Wash." [likely Yakima Co.]	WA	Emily Henriksen (?)
Pontia beckerii	10 May 1952	"Wash." [likely Yakima Co.]	WA	Henriksen or Hopfinger?
Papilio zelicaon	1959	"Wash." [likely Yakima Co.]	WA	Emily Henriksen (?)
Celastrina echo echo	[none given]	"Wash." [prob. Yakima Co. or San Juan Co.]	WA	Emily Henriksen (?)

There are 14 specimens in the Ely Collection from Oregon and Washington (Table 1), four of which are still in paper triangles that Terry gave me, apparently shipped to Rachel shortly before or after her death. One of the papered specimens is a male *Euphydryas anicia hopfingeri* in an envelope stamped with John C. Hopfinger's name, location and date (Fig. 6). **John Carl Hopfinger (30 Mar 1888–7 Jun 1961)** was a famous lepidopterist and charter member of LepSoc who spent most of his life in Brewster, WA. Originally from Austria, he immigrated to the United States in 1906. By the time he died, his personal collection numbered around 20,000 specimens, with many more in numerous private collections and museums (Eff 1962). Currently, nearly 1,800 Washington specimens collected by Hopfinger are in SCAN. However, the other Washington specimens in the Ely Collection don't quite fit with having come from Hopfinger: most are without specific dates, which Rachel seemed to copy down from other collectors if she was given the full date, they are from 1951 and 1952 which is out of sync with the single 1955 specimen from Hopfinger, and there are no records in SCAN of Hopfinger ever collecting *Heliopetes ericetorum*. Added to this is the fact that someone modified the original inked "*E. an. h.*" on the Hopfinger envelope by adding "*opfingeri*" in pencil, in handwriting very similar to the other three papered specimens (Figs. 6 & 7). The other three specimens are from Mt. St. Helens, WA and Dayton and O'Brien, OR (Fig. 7). The latter two locations provide a strong clue to the identity of the collector. After obtaining numerous papered specimens from Ann Albright between 2009–2015 at the Northwest Lepidopterists Workshop each fall in Corvallis, OR, I noticed that some of the fritillaries she and her late husband **Ray Albright (15 May 1914–18 Apr 2000)** collected were from O'Brien. They also lived in Dayton for

Fig. 6 (left). Papered specimen of *Euphydryas anicia hopfingeri* collected by J. C. Hopfinger. **Fig. 7** (right).Three papered specimens in the Ely Collection, likely from Ray Albright, compared with an Albright specimen label from 1997.

Table 2. Records in SCAN from the same date and area as the Mount St. Helens specimen in the Ely Collection.

Collection	Species	Date	Location	Collector
Ohio State C.A. Triplehorn Insect Collection	*Phellopsis porcata* (beetle)	9 Jul 1956	"Marietta Creek, Mount St. Helens, Cowlitz Co." [Marietta Creek is off the Kalama River southwest of Mt. St. Helens]	K. M. Fender
Oregon State Arthropod Collection	*Parnassius clodius claudianus*	9 Jul 1956	"Spirit Lake, Snohomish Co." [error: county should be Skamania]	J. Baker
Oregon State Arthropod Collection	*Parnassius clodius claudianus*	9 Jul 1956	"Spirit Lake, Mt. St. Helens, Skamania Co."	W. A. Neill
Oregon State Arthropod Collection	*Pieris marginalis marginalis* x3	9 Jul 1956	"Spirit Lake, Skamania Co."	S. J. Baker
Oregon State Arthropod Collection	Geometridae (unidentified)	11 Jul 1956	"Naffstadt Creek, Mt. St. Helens" [Hoffstadt Creek is off the Toutle River on the west approach to Mt. St. Helens]	[not given]
Oregon State Arthropod Collection	*Parnassius clodius claudianus*	12 Jul 1956	"Morton, Lewis Co." [this is along the northern route to Mt. St. Helens]	J. Baker

most of their lives. Besides matching the Ely specimen locations, the handwriting is remarkably similar between the four papered specimens and my specimens from Ann that she and Ray collected in the 1990s. In particular, the frequent lack of dotted i's and the way r's and t's are written. The a's and z's are a little different but whose handwriting hasn't changed a little over the course of a 40 year span? Ray was a LepSoc member from 1947 until his death in 2000, but I was unsure if he exchanged specimens directly with Rachel or through others. I wrote Ann in late 2019 and she said that Ray did collect around those areas during those dates and the handwriting looked like Ray's, but that it was before they were married so she could offer no other details. More recently, I searched SCAN for any records around those dates. The Oregon State Arthropod Collection (OSAC) has one record of *Ochlodes sylvanoides* collected by Ray Albright from O'Brien on 22 Jul 1958, the same date and location as my *Speyeria zerene gloriosa* specimen, further confirming my theory. Moreover, there are six records on or near the same date and location as the papered *Parnassius clodius* from Mount St. Helens, all collected by Oregon lepidopterists, indicating they traveled to the area together on a collecting trip (Table 2). While Ray is not included in these records, he frequently associated with Ken Fender, so it is probable that he was also on the trip. As for the other three Oregon specimens in the Ely Collection (Fig. 8), the dates of the Burns and Salem specimens do not match any SCAN records but are most likely also from Ray, as he often collected in southern Oregon and Salem is only 20 miles south of Dayton. The third specimen, dated 12 Aug 1952, could have come from Ray or one of his Oregon associates; there are two butterflies in OSAC from Klamath County, OR on the same date but the collector is not given.

Fig. 8. Other Ely specimens from Oregon. Labels written by Rachel (*Polites sabuleti*), Cindy (*Neophasia menapia*), and an unknown person (*Papilio rutulus*).

The remaining Washington specimens seem to have been collected by Emily Henriksen. Hopfinger is ruled out as previously noted, and two other Washington collectors, Donald P. "Don" Frechin (6 Jan 1918 –10 Dec 1991) and David L. Bauer, lack evidence of an Ely connection compared to Henriksen. Don Frechin was a prolific Washington collector of insects who widely exchanged specimens (Wagner 1993), including with Bill Sieker (Pelham pers. comm. 2023), but the only records in MPM are five *Anthocharis julia* collected 15 Apr 1951 from Mason County, WA. No Bauer records are listed in MPM and most of his Washington SCAN records are of *Hemileuca* species. Emily Henriksen's records very closely match the assortment of species and dates of Washington specimens in the Ely Collection.

Emily (Haupt) Henriksen (7 Oct 1904–13 Dec 1997), later Roedel, was a lesser known but nonetheless avid Washington collector who sold and traded specimens to build up a large personal collection of exotic Lepidoptera. Bob Pyle corresponded with Emily as a teenager in Colorado and

purchased some specimens from her, and was later able to meet her a few years before she died. Some years later, Bob heard of a couple who had a house full of butterflies in Montesano, WA. He was able to contact them and subsequently visit their home, where he discovered that the couple were in fact Emily's niece and her husband: Ruth and Harley Adamson (Pyle 2022, Pyle pers. comm. 2023). Ruth died in 2002 and sometime later Bob acquired from Harley the four Riker mounts containing all of Emily's Washington specimens. Sadly, the remainder of Emily's collection was destroyed in a house fire in 2014 (Pyle pers. comm. 2023). I recently acquired the four mounts from Bob (Fig. 9), so that the specimens can be pinned and individually labeled before being deposited at OSAC. There are 192 specimens in these displays, including two *Limenitis weidemeyerii* from Wyoming by Duke Downey, one *Icaricia icarioides blackmorei* from Mason County, WA collected by Don Frechin, and two *Papilio bairdii* from Arizona by David Bauer.

Emily was born in Brienne, Bessarabia (present-day Moldova and Ukraine) to parents of German heritage. In late August 1906, they immigrated to Ohio, where they became US citizens, before settling in Wirch, ND. They lived in Wirch until applying for a homestead in Richdale, Alberta on 18 May 1909, where they lived until they reentered the US via Eastport, ID on 24 May 1916 and settled in Milton-Freewater, OR. Emily's mother died from typhoid fever 18 Nov 1918, and her father remarried on 5 May 1919. Emily married her first husband, Clifford Henriksen, in Milton-Freewater on 2 Sep 1928. Emily and Clifford moved to Rainier, WA shortly after, where their only daughter, Carma, was born in 1930. They moved back to the Pendleton, OR area sometime between 1935 and 1940, then lived in the Portland-Vancouver area from 1940 to 1945, where Clifford worked at the shipyards during the war (Obituary 1971*a*, 1971*b*). From there, they moved to Orcas Island, WA, where Emily began collecting butterflies. Emily's obituary states they moved to Sunnyside, WA in 1949 (Obituary 1997), but based on the LepSoc membership directories (List of Members 1949, 1951) and butterfly record locations, they moved to Sunnyside around June 1950. Emily's records

Fig. 9. Emily Henriksen collection obtained by Bob Pyle. Most specimens were collected by Emily from Orcas Island and various sites in Yakima and Klickitat counties, Washington.

Table 3. Emily Henriksen records identified from SCAN; some records without a named collector are presumed to be from Emily based on location and date.

	Specimen Locations					
Collections containing Emily Henriksen records per SCAN database	WA	[prob. WA]	OR	CA	WY	**Total**
R. M. Bohart Museum of Entomology	2					**2**
Brigham Young University Arthropod Museum	1					**1**
Cleveland Museum of Natural History Invertebrate Zoology Collection	3					**3**
Colorado State University, C.P. Gillette Museum of Arthropod Diversity	7			1		**8**
Denver Museum of Nature & Science – Entomology	2		1	4	2	**9**
McGuire Center, Florida Museum of Natural History		5	5			**10**
Museum of Comparative Zoology, Harvard University	1					**1**
Milwaukee Public Museum	45			1		**46**
Michigan State University, Albert J. Cook Arthropod Research Collection	2					**2**
Smithsonian Institution, National Museum of Natural History				1		**1**
San Diego Natural History Museum	2					**2**
Entomology Collection at the Natural History Museum of Utah	6					**6**
University of Minnesota Insect Collection	17					**17**
University of Idaho, William F. Barr Entomological Museum	6					**6**
Yale Peabody Museum	25					**25**
Total	**119**	**5**	**6**	**7**	**2**	**139**

predominantly switch to sites in Yakima and Klickitat counties at that time, although she continued to visit and collect on Orcas Island in subsequent years. Clifford died on 16 Jun 1971 and Emily married Herman Roedel of Sunnyside on 8 Sep 1973. They lived in the McMinnville, OR area from 1974 through the 1980s. Herman died on 7 Mar 1989 in Eugene, OR, followed by Emily on 13 Dec 1997, also in Eugene. While most of Emily's butterfly records are focused on Orcas Island, Sunnyside, Satus Pass, Rimrock Lake, and a few sites near to those areas, a few records are from Spokane, WA and at or near Redding, CA. These are explained by Ancestry records which show that her daughter lived in Redding for a time and at least one grandchild was from Spokane. Emily collected and primarily sold specimens to lepidopterists seeking Washington species (Pelham pers. comm. 2023, Notices by members 1950*a*, 1950*c*, 1950*d*). She was a LepSoc member from 1949 to 1952, then disappears from the membership directory to at least 1955 (List of Members 1949, 1951, 1952, 1953, 1954, 1955), but collected from 1942 to at least 1981. Her last name is misspelled Henricksen (13 records), Hendricksen (5), Hendrickson (22) or Hendrikson (1), in addition to a few records of E.H. (10) and her second married name of Roedel from 1974-1981 in SCAN (11 records), making it difficult to research and assess her records. Accounting for these various spellings and including records with no collector name but the same locations and date range, there are 139 specimens in 15 collections recorded in SCAN, 46 of which are at MPM (Table 3). These, together with the Henriksen Collection, closely align with the Washington Ely specimens both in the similarity of species and date range. For example, an *Oeneis nevadensis* specimen in the Ely Collection (Fig. 10) is dated a day after several specimens from Rimrock Lake, Yakima County, WA in the Henriksen Collection, a location where Emily collected *O. nevadensis* on other trips.

Fig. 10. *Oeneis nevadensis nevadensis* female in the Ely Collection, dated one day after Emily Henriksen specimens from Rimrock Lake, Yakima County, Washington.

Circling back to David Bauer, he made frequent collecting trips to Arizona over several years as evidenced by records in SCAN, usually over a one- or two-week timespan. Several Bauer specimens bear the same date as one of two Arizona specimens in the Ely Collection: a *Euptoieta claudia* from Lonesome Valley, Yavapai County on 10 Jul 1951. However, the Bauer specimens are from Graham County, which is at least

a 5-hour drive away, making the *Euptoieta* possible but less likely to have been collected by him. The other Ely specimen, *Gyrocheilus patrobas* from Mingus Mountain, Yavapai County on 1 Sep 1950, is only a week removed from a Bauer record in SCAN from Mingus Mountain on 9 Sep 1950. Additionally, two specimens in the Henriksen Collection were collected by Bauer from Mingus Mountain in 1952, adding to the speculation that the two Arizona Ely specimens may have come from Bauer via Henriksen. David Bauer was a charter member of LepSoc from Washington and knew Don Frechin, Emily Henriksen, and probably Ray Albright. In summary, I believe that Rachel, either directly or through Bill Sieker, acquired the 1951–1952 group of Washington and Arizona specimens from Emily Henriksen, and the four 1955–1958 papered specimens from Ray Albright.

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Announcements, continued

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Memoirs of the Lepidopterists' Society

Are you thinking about developing or do you have a longer manuscript that would exceed the allowable page limit at typical scientific journals? If so, please consider submitting this longer, monograph-length work to the *Memoirs of the Lepidopterists' Society*. Submissions need not be memoirs in the strict sense (e.g., a historical manuscript or longer biographic treatise written from a personal knowledge). Instead, the Society's *Memoirs* publication has ranged, over the years from a checklist of butterflies of America north of Mexico (Volume 2) to a techniques manual for studying butterflies and moths (Volume 5) to a systematic revision of the tortrid genus *Paralobesia* (Volume 6). This broad array of topics is intentional; the Society wishes to use our Memoirs as a creative outlet for longer papers that would appeal to diverse audiences. Inquiries and submissions should be directed to Dr. Keith Summerville, editor of both the Journal of the Lepidopterists' Society and the Memoirs of the Lepidopterists' Society at **Keith.Summerville@drake.edu** or 515-271-2265.

Ross, *Gaillardia* for the dubious gardener, continued

Continued from p. 116

_____2016a. To attract early spring pollinators to your garden, up the ante. Southern Lepidopterists' News, June 30 (Vol. 38:2), pages 117, 122-125, 127.

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_____ 2017. Treat your bees to a banquet of poppies. Bee Culture, January (pages 46-48).

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Announcements:

The Association for Tropical Lepidoptera

Please consider joining the ATL, which was founded in 1989 to promote the study and conservation of Lepidoptera worldwide, with focus on tropical fauna. Anyone may join. We publish a color-illustrated scientific journal, Tropical Lepidoptera Research, twice yearly (along with a newsletter), and convene for an annual meeting (see announcement, right), which may change venues and times year by year as the ATL often shares a venue with the Southern Lepidopterists' Society.

Dues are $95 per year for regular members in the USA ($80 for new members), and $50 for students. Regular memberships outside the USA are $125 yearly. See the troplep.org website for further information and a sample journal. Send dues to ATL Secretary-Treasurer, PO Box 141210, Gainesville, FL 32614-1210 USA. We hope you will join us in sharing studies on the fascinating world of tropical butterflies and moths.

The Southern Lepidopterists' Society

The SLS was established in 1978 to promote the enjoyment and understanding of butterflies and moths in the southeastern United States. Regular membership is $30.00. Student and other membership categories are also available. With membership you will receive four issues of the SLS NEWS. Our editor J. Barry Lombardini packs each issue with beautiful color photos and must-read articles. The SLS webpage (http://southernlepsoc.org/) has more information about our group, how to become a member, archives of SLS NEWS issues, meetings and more.

The annual meeting is typically in September or October, often in a shared venue with ATL (see above, right).

Please write Marc C. Minno, Membership Coordinator, at **marc.minno@gmail.com** if you have any questions. Dues may be sent to Jeffrey R. Slotten, Treasurer, 5421 NW 69th Lane, Gainesville, FL 32653.

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. Annual dues are $15.00 for the hard copy of the News; $12.00 for electronic copies. **The annual meeting this year is Nov. 1-3.** Follow the Society's facebook page for updates on future meetings and potential field trips at **https://www.facebook.com/societykentuckylep/**.

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

and

ASSOCIATION FOR TROPICAL LEPIDOPTERA

The McGuire Center for Lepidoptera and Biodiversity will host the next meeting of the two societies during the weekend of October 11-13, 2024. In addition to the exciting program of talks and local trips, we will also celebrate the 20th anniversary of the Center. Please, mark you calendar and stay tuned for more information.

-McGuire Center Staff

The Ron Leuschner Memorial Fund for Research

The 2025 cycle of the Ron Leuschner Memorial Fund for Research on the Lepidoptera is now open for applications. Each year, the Society will fund up to 3(+) grants for up to $500 each to undergraduate or graduate students depending on merit. Applicants must be members of the Lepidopterists' Society. Applications are due **January 15, 2025**. The application must include submission of the application form, posted on the Lep Soc website at **https://www.lepsoc.org/content/awards**, a brief (500 word maximum) proposal, and a letter of recommendation or support from the student's academic advisor or major professor. Additional information about the research fund or a copy of the application can also be obtained by writing to Dr. Shannon Murphy. Submit all of the above to Shannon Murphy at **Shannon.M.Murphy@du.edu**. Snail mail applications should be sent to Shannon Murphy, Associate Prof., Boettcher West 302, Dept. of Biological Sciences, University of Denver, 2050 E. Iliff Avenue, Denver, Colorado 80208. Successful applicants will be notified by March 15. The review committee consists of members of the Lepidopterists' Society, including the previous year's successful candidates (who are thus not eligible for a new award in the subsequent year's competition). Award recipients will be expected to produce a short report for the committee at the conclusion of their year of funding, which summarizes the positive impact of the award on their research. Recipients must also acknowledge the Fund's support in any publications arising out of the funded work.

Searching The Lepidopterists' Society Season Summary on SCAN

Brian Scholtens and Jeff Pippen

Part of what we are now doing as a society is contributing all our Season Summary records to SCAN (Symbiota Collections of Arthropods Network), a larger effort to assemble and make available occurrence records of insects and other arthropods to the greater scientific community and the public in general. Each year we now upload all of the submitted Season Summary records to this site. In addition, several years of back records are also hosted here, and we hope to continue adding past years as that is possible.

Now that our Season Summary is available online, we provide below a simple set of instructions about how to use the SCAN database to search our available records. This process is easy, but not immediately obvious when you start exploring the site. To get started you can go directly to the SCAN site using the link below, or you can access it through The Lep Soc webpage using the link under Season Summary. Then just follow the set of instructions below to access, search and download any data from the Season Summary. The first two instructions set up the search feature to search only the Lepidopterists' Society records. If you would like to include other databases, you can select them in addition to our database. Have fun and explore a bit. There are lots of interesting datasets on the site, including quite a few from major and minor collections as well as some important personal collections. Have fun exploring our data and those in the other databases.

1) Go to: **https://scan-bugs.org/portal/collections/index.php**
2) Click on Select/Deselect All to deselect all databases
3) Scroll to near the bottom of the list and select Lepidopterists' Society Season Summary
4) Go back to the top and click on Search
5) Choose whatever criteria you would like and tell to complete search
6) Records will be displayed
7) Click on the icon in the upper right if you would like to download records
8) Click on appropriate choices – this will download comma separated or tab separated data, which can be compressed or not
9) Click Download Data

Lep Soc Statement on Collecting

The Lepidopterists' stance on collecting is discussed fully in The Lepidopterists' Society Statement on Collecting Lepidoptera. This is available online at: **https://www.lepsoc.org/content/statement-collecting**

Lep Soc Statement on Diversity

This is available at any time, should you need to know at: **https://www.lepsoc.org/content/statement-diversity**

PayPal -- the easy way to send $ 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. 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. Thanks!

Call for Season Summary Records

The Season Summary database is on the Lepidopterists' Society home page (http://www.flmnh.ufl.edu/lepsoc/). The value of the online database increases as your data gets added each year. For your 2024 field season, report range extensions, seasonal flight shifts, and life history observations. Reports of the same species from the same location provides a history. However, do not report repeated sightings of common species. Report migratory species, especially the direction of flight and an estimated number of individuals. Send this information to your Zone Coordinators -- they and their contact information appears on the inside back cover of the "News". The states covered by each zone are in the (most recent) Season Summary. Please have your data to the Zone Coordinator(s) no later than **December 31, 2024**. All of these records may be useful in the future. BE AWARE that some of these records will go IN THE DATABASE, but may NOT appear in the printed Season Summary.

Season Summary Spread Sheet and Spread Sheet Instructions

The Season Summary Spread Sheet and Spread Sheet Instructions are available on the Lepidopterists Society Web Site at **http://www.lepsoc.org/season_summary.php.** The Zone Coordinators use the Season Summary Spread Sheet to compile their zone reports. Please follow the instructions carefully and provide as much detail as possible. Send your completed Season Summary Spread Sheet to the Zone Coordinator for each state, province or territory where you collected or photographed the species contained in your report.

Photographs for Front and Back Covers

Please submit photos for the front or back covers of the Season Summary to the editor of the News, James K. Adams (**jadams@daltonstate.edu**). Photos can be of live or spread specimens, but **MUST** be of a species that will actually be reported in the Season Summary for this year.

Brian Scholtens and Jeff Pippen.

(*Continued on page 123*)

The Marketplace

Equipment & Book(let)s

WOODEN FIELD BOXES, for sale. Large size (13-1/4 x 17-1/2 x 3-3/4 in.), hinged with latch, inlaid double-sided with pinning foam.$15 each, plus shipping costs.

THE MONARCH, booklets for sale. Full color, with notes on monarch migration in N. America, and conservation efforts by Orley Taylor and Lincoln Brower. The booklet includes photos by T. C. Emmel, H. O. Hilton, Kurt Johnson, Walter Reinthal, Gary Ross, and E. S. Ross. 42pp.$7 each, plus $4 shipping.

J. Heppner, P. O. Box 15718, Gainesville, FL 32604 663

Tropical Trips

2024 Lepidoptera Expeditions to Guatemala and Paraguay

Lepidoptera Expeditions is offereing several trips with collecting possible to the following locations this year: Guatemala, September 1-15, 2024; and Paraguay (2 parts, can be combined into one long trip), October 19-31 and November 1-15, 2024. Please contact Lepidoptera Expeditions (Scientific Publishers), P.O. Box 15718, Gainesville, FL 32604. You can also call the following number and leave a voice mail (352-373-5630) or email at **troplep@aol.com**.
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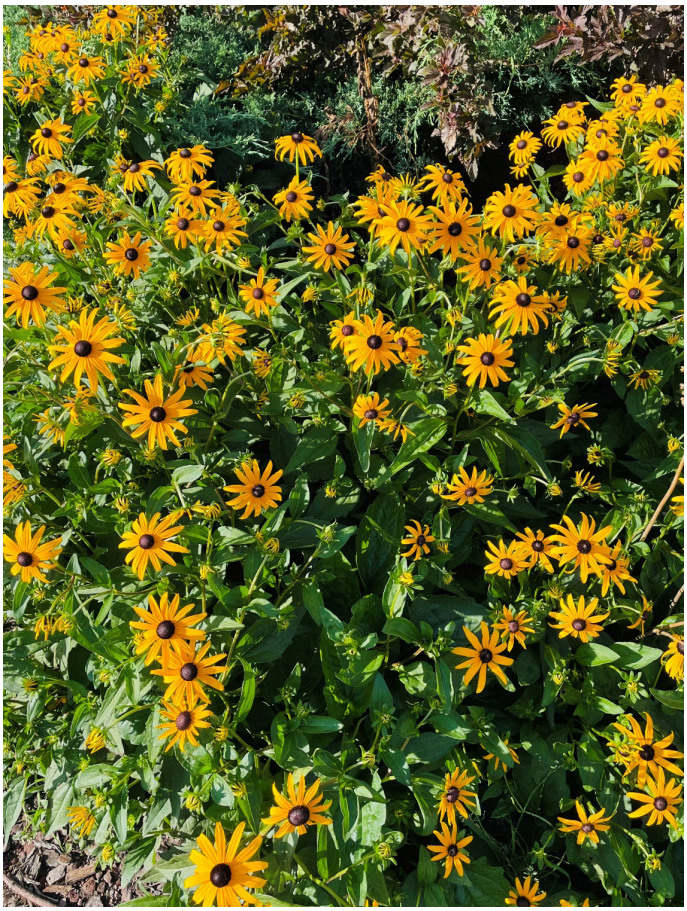

Fig. 2. *Rudbeckia fulgida* Aiton (Asteraceae), photo by Alma Solis, July 2024, Lepidopterists'Society Annual Meeting, Cornell University campus, Ithaca, New York.

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.

We now accept ads from any credible source, in line with the New Advertising Statement at the top of this page. **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.**

Expanded distribution and new host plant record for *Udea profundalis* (Packard) (Crambidae: Spilomelinae) in the United States

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Udea Guenée (Crambidae: Spilomelinae) is a worldwide genus of 217 described species, including some with Holarctic ranges (Nuss et al. 2003–2004, Mally et al. 2018). In 1966, Munroe reviewed 23 North American species of *Udea*, including *U. profundalis* (Packard, 1873) (Fig. 1). *Udea* is the largest lineage of Spilomelinae in the United States (Scholtens & Solis 2015), where the most common species is *U. rubigalis* Guenée, or Celery Leaf-tier, a polyphagous pest of herbaceous plants (Powell & Opler 2009).

Fig. 1. Adult of *Udea profundalis* (Packard, 1873), Oregon, 7 mi. W. Portland, Collection C. William Nelson, wing length=11 mm.

Rudbeckia fulgida Aiton (Asteraceae) (Missouri Botanical Garden 2024) (Fig. 2, opposite page), commonly known as Goldstrum, Orange coneflower, or Black-eyed Susan, is native to the eastern United States. Flowers are attractive to butterflies and the seeds are eaten by birds. Many varieties are sold by nurseries because it is a highly temperature tolerant species. In June and July of 2023, two large shipments of goldstrum were shipped from a Colorado supplier to a local tree farm near Rupert, Idaho. The plants were received as plugs and promptly transferred into pots. On March 8, 2024, the plants were inspected, and larvae subsequently identified as *U. profundalis*, were found in the soil of pots in 3 different open greenhouses containing these plants, presumably preparing to pupate (see below). Only *U. profundalis* larvae were found curled up in the soil of the potted plants, despite many potential ornamental host plants being present in the greenhouses. On March 12th, samples were collected by JT along with plant material. Preserved larval specimens were sent to MAS for analysis. Four larval specimens were left in a caged office environment (approximately 65-70 degrees 10% humidity) with a grow light and a potted goldstrum plant. On April 5th, adult moths began to emerge within the cage. Specimens were then frozen and sent to MAS for dissection and identification.

Udea profundalis is a western U.S. species described by Packard in 1873 based on two males and 3 females collected in California by Hy. Edwards. Munroe (1966) reported *U. profundalis* from British Colombia in Canada, and Washington, Oregon, and California in the United States. We report *U. profundalis* (Fig. 1) from Logan, Vineyard, and Lehi, in Utah, Reno and Pyramid Lake, in Nevada, and Moscow (collected in 1952 by H. C. Manis) and Rupert, Idaho, in the United States, based on voucher specimens located at the National Museum of Natural History, Smithsonian Institution, Washington, D.C.

We report larvae of *U. profundalis* feeding on *Rudbeckia fulgida* (Asteraceae) for the first time. The larvae "tend to stay on the underside of the leaf, with a slight shelter, and they have nearly transparent integument, so their color matches the foliage eaten. Pupation occurs in a weak cocoon on the ground." (Powell & Opler 2009, p. 177). It is a polyphagous species known to feed on 10 plant families, including the genera *Chrysanthemum* L., *Senecio* L., and *Crepis* L. in the Asteraceae (Robinson et al. 2002, Comstock & Henne 1968, Powell & Opler 2009).

Acknowledgements

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(*Continued on page 153*)

World entomological treasure in Australia

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Investigations in the historical cabinets of Alexander Macleay (1767-1848) were conducted at the Chau Chak Wing Museum of the University of Sydney, between June and September 2023. The aim was to locate some possible type specimens of butterfly species described by contemporaries of Alexander Macleay, notably Johan Fabricius (1745-1808), Dru Drury (1724-1803) and Edward Donovan (1768-1837). This lively community of Linnean entomologists exchanged and purchased from each other's collections, which has made tracing of individual specimens complex. Remarkably, however, over two hundred primary type specimens were located (McIntyre 2023, Viloria et al. 2023).

The Chau Chak Wing Museum houses the biological collections and part of the personal library of Alexander Macleay, wine merchant, civil servant and Secretary of the Linnean Society of London (1798-1825), a posting that gave him intimate access to collections sold and traded in London. In 1826 he was appointed Colonial Secretary of New South Wales, Australia. He arrived in Sydney with his famous cabinets, depriving scholarly circles in England and Europe of access to an important accumulation of natural history objects (Stanbury and Holland 1988, Cherry 2012, Donaldson 2017). Through the reasoned study of copies of catalogues from various auctions, preserved in Sydney, annotated by hand by Macleay himself, it is possible to reconstruct, at least partially, the historical complexity of the acquisitions of a large part of the collections of Drury and Donovan particularly.

Work with the Macleay specimen drawers and the hand-coloured plates of Moses Harris (1730-1787) published in Illustrations of Natural History (Drury, 1770, 1773, 1782), resulted in the unexpected detection of a high proportion of the biological samples originally examined to illustrate the lepidopteran insects. (Calhoun 2023a, 2023b).

Vital too were the legendary watercolors of William Jones (1745-1818) (Waterhouse 1938), which represented not only an important part of the fine entomological collection of Drury, but also that of Jones himself and those of his contemporaries John Francillon (1744-1816) and John Latham (1740-1837), among others. Across a large collection of entomological material examined, numerous specimens of butterflies, preserved in the 18th century, were identified thanks to Jones' astonishing precision as an illustrator – and the maintenance of historic pinnings retained by generations of curators of Macleay's cabinets.

Jones' Icones, kept for almost a century at the University of Oxford, have only become publicly available in recent years (Vane-Wright/OUM 2021). Their artistic merit is notable, to which is added the tremendous scientific value of having been studied by the Danish entomologist Johann Christian Fabricius during the preparation of his Entomologia Systematica (Fabricius 1793), a work in which he described just over 150 butterfly species based on Jones' Icones. Fabricius and Jones established an effective system of cross-references between their texts and figures, respectively, which has allowed for subsequent unequivocal identification of these taxa.

During our studies we identified and labelled:

- the primary types of 91 of the 104 nominal species of diurnal lepidopterans (87.5%) described by Dru Drury (1773-1782)
- the primary types of 151 of the 205 nominal species of butterflies and skippers (73.7%) described by Johan Christian Fabricius (1793), from Jones' Icones,
- the primary types of 14 of the 15 nominal species of butterflies (93.3%) described by Edward Donovan in his works on the insects of China (1798-99) and Australia, New Zealand, New Guinea and associated islands (1805).

We have also located 29 other primary types of several other Lepidoptera, including 4 species of moths. The 281 primary type specimens discovered account for 260 nominal lepidopteran species described between 1770 and 1805.

Along with advances in digital technologies and recent publications that allow for greater comparative analysis, another factor accounts for the large number of primary types - neglect. To date, several authors have emphasized the probability that Alexander Macleay's specimens were lost or destroyed. Detailed results derived from our research (Viloria et al. in prep.) will state the protocol that ensured the detection of this valuable biological material associated with descriptive works from the founding period of Linnaean taxonomy, and will describe the methods of verification of provenance and identity of each of the specimens. The discovery of the primary types of these species of butterflies and moths and their formal designation in

accordance with the regulations established by the International Code of Zoological Nomenclature (ICZN 1999) anticipate the invalidation of a few neotypes previously designated without appropriate historical investigations nor sufficient searches in collections and museums.

Our extraordinary find is of paramount relevance for the nomenclatural stability of a significant number of butterfly taxa from around the world, most of them well-known and even emblematic species in several countries, but others frankly rare or probably extinct. This discovery highlights the need to fairly value historical and ancient collections, which too often are disdained by prevailing fashion or have remained partially forgotten in museums judged as minor institutions due to their local or provincial character.

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Artificial hybrids within the famliy Saturniidae

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Motivated by Peigler's (1977, 1978, 1980(81)) successes obtaining intrageneric and intergeneric *Callosamia* hybrids, the senior author has since attempted several crosses within various saturniid genera. In this paper we present a brief review of the results of those efforts accompanied by photos of select hybrid adults and larvae. Although we have some issues with recent changes, in all cases taxonomy will be as it appears in the recent checklist by Pohl and Nanz (2023).

Genus *Eacles*

***Eacles pini* male X *E. imperialis* female**

In 1992 we obtained a cross between a wild *pini* male from Cheboygan Co., MI, and a reared *imperialis* female from Kalamazoo Co., MI. The male arrived at light at approximately 0115 hrs. EDST. The female was housed in a cage roughly 20 meters distant, and she was observed to be calling (emitting pheromone). The male, which was very old and barely able to fly, was placed in the cage and mating occurred when he contacted the female. The female laid a full complement of ova over the next few days and hatch rate was very high. Larvae were reared on sassafras, a common *imperialis* host.

Larvae (Figs. 1 & 2) exhibited both green and brown color morphs. The length of the dorsal scoli of the hybrid larvae was variable but closer to those of *pini* than *imperialis*. The hybrid adults eclosed in mid to late May 1993. They were very similar to the parent species and intermediate in size; the only phenotypic character worthy of note is the presence of a prominent postmedial line on the hindwing underside, which is characteristic of *pini* but lacking in *imperialis*. Hybrid females contained a full complement of ova; however, no backcrosses were attempted to test fertility.

Figs. 1 & 2. *E. pini* male x *E. imperialis* female (5th instars).

Genus *Anisota*

Several crosses were attempted in this genus. All *oslari* used in these efforts were reared from Santa Cruz Co., Arizona stock, while all other species used (with the exception of *peigleri)* originated in Lucas Co., Ohio. In all crosses, except as noted in the reciprocal *senatoria* X *virginiensis* crosses, females laid a full complement of ova and percent hatch was very high. All larvae were reared on various oaks. In all combination attempts, except *senatoria* X *peigleri*, larval losses were considerable, and only a few pupae were ultimately obtained. In all cases where hybrid adults were obtained, females appeared barren (again, except for *senatoria* X *peigleri*) as evidenced by their shrunken abdomens, therefore, no backcrosses were attempted. Further discussion of hybrid adult and larval characteristics will be addressed in the individual treatments that follow.

***A. senatoria* male X *A. oslari* female**

Captive *oslari* began to eclose in mid-July 1987. A female began to call in mid-morning, and a wild *senatoria* male responded and promptly coupled with the female. In spite of the significant difference in the relative sizes of the parent species, *oslari* being much larger than any eastern North American *Anisota* species, the *senatoria* male had no difficulty in immediately coupling with the *oslari* female.

Hybrid larvae (Fig. 3) were darker in ground color than the orange–red color of *oslari* larvae. Lateral orange stripes were present though somewhat diffuse compared with *senatoria.* Head capsules were orange as in *oslari.* Resulting hybrid adults eclosed the following year, females in early April, and males in mid-July. Hybrid adult males approach their female siblings in size (Fig. 4), whereas the male-female size differential is significant in both parent species. The hybrid males are pinkish-orange and *oslari*-like in that they lack the translucent hyaline forewing patch that is prominent in *senatoria.* Hybrid females are basically all orange and exhibit a mix of parental characters. They are *oslari*-like in lacking the dark forewing stippling present in nearly all *senatoria* females, but *senatoria*-like in having faint postmedial lines that are lacking in *oslari.*

***A. senatoria* male X *A. stigma* female**

In early July 1991, a reared *senatoria* male was confined in a small

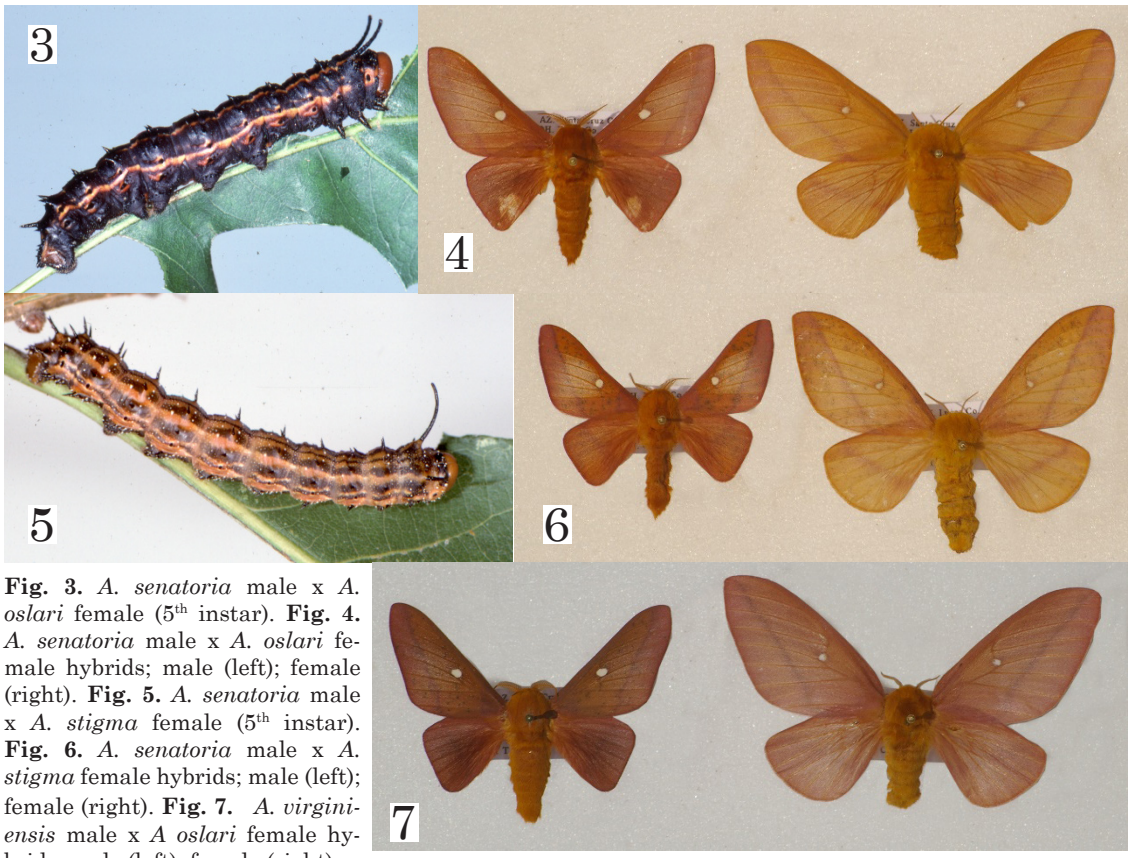


Fig. 3. *A. senatoria* male x *A. oslari* female (5th instar). **Fig. 4.** *A. senatoria* male x *A. oslari* female hybrids; male (left); female (right). **Fig. 5.** *A. senatoria* male x *A. stigma* female (5th instar). **Fig. 6.** *A. senatoria* male x *A. stigma* female hybrids; male (left); female (right). **Fig. 7.** *A. virginiensis* male x *A oslari* female hybrids; male (left); female (right).

flight cage with a reared *stigma* female. The female began calling around 0800 hrs. EDST. Not surprisingly, since these two species occur sympatrically in northwest Ohio and exhibit pheromone differentiation, the male exhibited no response to the calling female. A reared *senatoria* female, confined in a separate nearby cage, began calling later in the morning, and the male quickly became active suggesting that slightly different daily flight periods may also provide a degree of temporal isolation. However, in this artificial situation, upon contacting the *stigma* female through incidental contact, the male quickly coupled with her.

Hybrid larvae (Fig. 5) had alternating light and dark dorsolateral striping; the light stripes tended to be the pinkish-orange of *stigma* rather than the yellowish-orange of *senatoria.* Final instars had elongated scoli, heavy white stippling, and orange head capsules as in *stigma.* Resulting hybrid adults (Fig. 6) exhibited a striking difference in emergence times with all females eclosing in October of the same year, while all males overwintered and eclosed in June 1992. Hybrid males are a dark reddish brown ground color with dark stippling on both wings as in *stigma* but with a semi-translucent hyaline area on the forewing though much less pronounced than in *senatoria.* Wing shape is very much as in *senatoria* with more acute angles rather than the rounded outer wing margins of *stigma.* Hybrid females are difficult to separate from pure *senatoria.*

A. virginiensis male X *A. oslari* female

In late July 2000, a reared *oslari* female began calling in mid-morning and promptly attracted a wild second-generation *virginiensis* male. The male had no difficulty in quickly coupling with the much larger female.

Hybrid larvae were darker overall, much as in *virginiensis.* Pink longitudinal stripes were present, though less prominent and rather diffuse compared to *virginiensis.* Head capsules were orange as in *oslari*, but a bit darker [no images available]. Resulting adults (Fig. 7) eclosed the following year, females in early to mid-May, and males mid-July to early August. Hybrid adult males are larger than the parental *virginiensis* male but not larger than a typical *virginiensis* female; therefore, as with the *senatoria-oslari* hybrids mentioned above, the gender size differences, so evident in pure *Anisota* species, were noticeably reduced. Like *oslari,* hybrid males lack the translucent hyaline forewing patch that is prominent in *virginiensis.* Hybrid forewing ground color is brown with only a slight trace of a pinkish hue along the margins, while the hindwings are of a dark red wine color. Interestingly, dark stippling was present on the forewings, a character absent in both parent species, at least in material we have examined. The wings of hybrid females are a uniform pinkish brown unlike the light brown color of *oslari.*

A. senatoria and *A. virginiensis* crosses

Both reciprocals of this cross were attempted in mid-July 1999. Mid-July is the beginning of the second-generation flight of *virginiensis* in northwest Ohio, which barely overlaps the end of the single generation *senatoria* flight. Two cages, one containing a reared *senatoria* female, the other containing a reared *virginiensis* female, were placed ca. 10 meters apart in an oak savanna habitat. Both females were calling during the same mid-morning period, and numerous wild males responded to their respective females. Subsequently wild males were netted and placed in cages with an opposite-species female. In order to maximize male responses to pheromones, the cages were then placed

next to one another. Males remained active in response to the proximity of their own calling females, eventually resulting in cross matings once incidental contact occurred. After separation, examination revealed that females of both species had been damaged by the interspecific couplings. They were unable to oviposit and expired shortly afterward. Two factors render these failed hybridization attempts interesting. First, it is not surprising given that sympatric species with overlapping female calling periods would have developed pheromone differences as a barrier to hybridization. Yet how is the positive response to the *oslari* pheromone by both *senatoria* and *virginiensis* males explained? Second, workers, for example Peigler (1977), have noted an occasional problem with females in hybridization attempts being ruptured by a mating with a male with significantly larger genitalia. However, we know of no examples where both of the reciprocal attempts resulted in damage to the females.

***A. senatoria* male X *A. peigleri* female**

This cross was made in 1994 by a calling *peigleri* female reared from Whitley Co., Kentucky stock, attracting and mating with a wild *senatoria* male. Among the hybridization attempts involving *Anisota* from the eastern USA, this was the only combination that did not exhibit pheromone differentiation. Hybrid females contained a full complement of ova, and the hatch was very high. Larvae were vigorous throughout, and no significant larval losses were experienced as with the previous crosses. Adults eclosed in July of the following year with a synchronized emergence of males and females. As previously reported in Tuskes et al. (1996), hybrid females were backcrossed to wild *senatoria* males with no loss of viability or fertility.

The length of the scoli of the hybrid larvae was intermediate in length between those of *peigleri* from southeastern Kentucky and *senatoria* from northwest Ohio; similar intermediate armature has been reported in nature (Tuskes et al. 1996). Hybrid adults are indistinguishable from the parent species.

There were dramatic differences between this cross and all of the previous *Anisota* crosses with respect to female fecundity, pheromone response, and larval viability. Given the indistinguishable adult forms and significant biological traits shared by *senatoria* and *peigleri,* it appears that the taxonomic distinction between the two is based upon the geographic variation in larval scoli length (Riotte 1975; Burke & Peigler 2009). Interspecific clinal variation in larval morphology is not uncommon (Tuttle 2023; Collins et al. 2024). Given the lack of differentiation between *senatoria* and *peigleri* as shown above, perhaps populations from these closely related taxa should be subjected to advanced genomic studies to resolve the taxonomic status of *peigleri*.

(*A. virginiensis* male X *A. oslari* female) male X *A. senatoria* female

In mid-July 2001, a hybrid male *virginiensis* X *oslari* mated with a caged calling *senatoria* female. The hybrid male promptly responded to the calling female and coupling was immediate. Since no other *Anisota* females were present in the study area, it seems clear that the prompt response and coupling was due to pheromone response, as opposed to incidental contact.

Hybrid larvae were dark in color as in members of the *senatoria* and *virginiensis* species group. Lateral stripes were present, but rather diffuse and not at all prominent with a barely perceptible pinkish red overlay. Even though traits of *senatoria* and *virginiensis* were prominent, the head capsules were of an orange hue similar to *oslari*, but darker and somewhat duller. Orange head capsules appear to be a dominant trait in the *Anisota* genus. Resulting adults eclosed the following year, females in mid-May and males in mid-July to early August (Fig. 8). Hybrid males are similar to *senatoria*, except the translucent forewing patch, is absent. Other than the somewhat elongated shape of the forewings typical of hybrids involving *oslari*, hybrid females are indistinguishable from *senatoria*. Both sexes are similar in size to *senatoria* and *virginiensis*.

Genus *Syssphinx*

***Syssphinx hubbardi* male X *S. bicolor* female**

In early August 1983, we achieved a cross between a wild *hubbardi* male and a reared *bicolor* female from Shelby Co., Tennessee stock. The male came to light in Pena Blanca Canyon, Santa Cruz Co., Arizona. The pair was confined in a small muslin covered margarine-style tub. Examination the following morning revealed the pair in copula, but due to the lack of observation throughout the evening, it was not possible to determine if mating was achieved through pheromone response or by incidental contact. Upon separation, the female laid a full complement of ova over the following days. Percent hatch was high, and larvae were reared to maturity on honey locust with minimal losses. Honey locust is a natural *bicolor* host, and *hubbardi* thrives on it when substituted for its natural hosts. Larval development was quite rapid with adults eclosing early to mid-October the same year. Males were vigorous and healthy. A few females exhibited some difficulty fully expanding their wings, and all had shrunken abdomens due to lacking a full complement of ova.

The hybrid larvae were intermediate in appearance, the most notable difference being an increase in length of scoli when compared to *bicolor*. Pearly white scoli are present in varying lengths on *bicolor,* while they are uniform in length on *hubbardi.* Hybrid adult forewings are gray to grayish-brown, similar to spring generation *bicolor* (Fig. 9). The dorsal hindwings have a reduced amount of red being reminiscent of many *hubbardi*. Postmedial lines are somewhat crenulate, leaning towards *hubbardi*; these lines are barely discernable on the hindwings. A black

Fig. 8 (top). (*A. virginiensis* x *A. oslari*) male x *A. senatoria* female hybrids; male (left); female (right). **Fig. 9 (bottom).** *S. hubbardi* male x *S. bicolor* female hybrids; male (left); female (right).

hindwing eyespot, a character lacking in *bicolor*, is present though more diffuse than in *hubbardi*.

Genus *Callosamia*

Artificial hybridization experiments with *Callosamia* species have been conducted for many years, perhaps most notably by Peigler (1977, 81). While we have conducted such experiments, we can offer no new information on interspecific crosses in captivity. However, it is worth reporting on the occurrence in Lucas Co., Ohio of a possible wild hybrid male of *angulifera* X *promethea*. The suspected hybrid responded to a caged calling *promethea* female 27 May 1988, at ca. 2100 EDST. In northwest Ohio, virgin females of *promethea* typically cease calling prior to that time, however this individual persisted.

The suspected wild hybrid and artificial hybrids are very similar in all respects (Fig. 10). The discal spots in both are greatly reduced in size and less sharply defined than in *angulifera*. The antennae are darker in color than in *angulifera*, especially in the wild specimen. If truly a hybrid, we can only speculate on the gender combination of the parents, but relative species abundance suggests a possibility. Tulip tree, which is the only known *angulifera* host but also serves as a natural host for *promethea*, is localized and not especially common in northwest Ohio. As a consequence, *angulifera* maintains a minimal local population, unlike the much more common and widely distributed *promethea* which accepts several additional larval hostplants. In nearly 65 years of observation, the senior author has encountered only five specimens of *angulifera* locally. This is in sharp contrast to its abundance in southeast Ohio, and even to the northwest in Kalamazoo Co., Michigan (W. A. Miller, pers. comm.). As a consequence of that apparent rarity, the parent male of the suspected hybrid may have been an *angulifera* that was unable to locate a female and, as a consequence, may have responded to the late calling *promethea* female. This seems plausible since the three *Callosamia* species do not appear to have different pheromones and usually otherwise avoid interspecific mating through a combination of daily temporal isolation and, to a lesser degree, seasonal isolation (Tuskes, et al. (1996).

Callosamia and *Hyalophora* Intergeneric Crosses

C. angulifera male X *H. cecropia* female

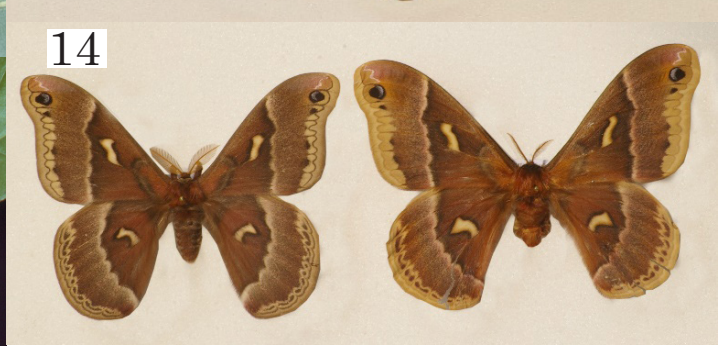
In June 1979 the senior author obtained successful hand-pairings between *C. angulifera* males from Boone Co., West Virginia and *H. cecropia* females from Lucas Co., Ohio. Approximately one-third of the resulting ova hatched, and larvae were reared on tulip tree. Most larval losses occurred in the first two instars, and approximately 75 cocoons were obtained, resulting in 42 hybrid adults. For specific information on materials, methods, and discussion, the reader is referred to the article by Carr (1984). This cross, using the same parental combination, was achieved in June 1985 with materials, methods, and results identical to the June 1979 cross. We illustrate a mature larva (Fig. 11), and reared adults (Fig. 12).

C. angulifera male X (*H. gloveri* male X *H. columbia* female) female

In June 1986 the senior author obtained a hand-paired mating between a *C. angulifera* male, from Boone Co.,

Fig. 10. The suspected wild hybrid male is pictured in the upper left; for comparison a male artificial hybrid of the cross *angulifera* male X *promethea* female (upper right), a wild *promethea* male (lower left), and a wild *angulifera* male (lower right) are pictured.

Fig. 11. *C. angulifera* male x *H. cecropia* female (5th instar). **Fig. 12** *C. angulifera* male x *H. cecropia* female hybrid adults; male (upper left) and two females. **Fig. 13.** *C. angulifera* male x (*H. gloveri* male x *H. columbia*. **Fig.14**. *C. angulifera* male x (*H. gloveri* male x *H. columbia* female) hybrid adults; female) (5th instar) male (left); female (right).



West Virginia, and a hybrid female of the cross of a *H. gloveri* male from Bernalillo Co., New Mexico x a *H. columbia* female from Montcalm Co., Michigan using materials and methods as in the previous cross.

Larvae were reared on tulip tree. Losses were minimal and usually accidental, with disease not of any significance. Mature larvae (Fig. 13) were of a light blue-green in color. The yellow subspiracular stripe, typical of *angulifera*, was completely absent. Dorsal scoli were white at the base, segueing into yellow at the tip. Remaining scoli were less yellowish at the tip, except the anterior pair which were similar to the dorsal scoli. None of the scoli were ringed with black at the base, whereas this character is present in both *C. angulifera* and *Hyalophora* larvae.

Ca. 60 cocoons were obtained, and several males and a few females successfully eclosed early to mid-June 1987. Many cocoons contained dead pupae and most females had difficulty escaping their cocoons. Those females that did successfully eclose had some degree of difficulty in expanding their wings, and none contained ova. Hybrid males are brown with a wine-red overlay. Hybrid females are lighter brown and lack the wine-red shading. The white postmedial lines are shaded pink outwardly in the females, but not so in the males. This pink shading is lacking in the parent species involved in this cross. Discal spots tend to be acutely angled in the hybrids; a characteristic shared with *C. angulifera*. A second character tending towards *C. angulifera* is that the antennae are brown, whereas they are black in *Hyalophora*. Otherwise, the sexes are similar (Fig. 14).

The hybrid female used in this cross contained a full complement of ova, an unusual occurrence in *Hyalophora*. In fact, in our experience, all of our attempts rearing *Hyalophora* hybrids have resulted in barren females. Collins et al. (2024) feature a comprehensive discussion on hybridization in *Hyalophora* and continue to treat *gloveri* as a subspecies of *columbia*. We believe that the fully viable artificial hybrid *columbia* X *gloveri* female used in this cross is additional strong evidence supporting their view.

ACKNOWLEDGMENTS: We thank Dan Wente and Robyn Carr for invaluable assistance with computer formatting.

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Madagascar and New Caledonia hawkmoth biogeography

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Fig. 1. *Compsulyx cochereaui* of New Caledonia. Photo by Thierry Salesne. See Haxaire *et al.* (2023) for biological and taxonomic characteristics.

Moths and butterflies get around. Obviously they are mobile, dispersive organisms, and some have near global distribution ranges involving wide ranging individual flights. It might stand to reason that this ability explains the divergence of disjunct Lepidoptera taxa, including those separated by oceans. This assumption has never been supported from empirical evidence. Instead, the most common practice by far is to interpret allopatric distributions (including disjunctions) as the result of organisms sequentially moving by 'chance' from one locality (center of origin) to another. Sometimes this idea is dressed up by using automated recipes where distributions are simplified into a series of areas (which do not exist as empirical entities) that are few in number (often less than 10).

The trouble with automated vicariance-dispersal programs is that they find chance dispersal or vicariance because of how particular patterns of relationship are defined in the algorithm. These definitions may have nothing to do with reality. This disparity is particularity problematic when area patterns are designated as evidence of sequential dispersal even though they could be the result of sequential vicariance. A recent example of the disparity is illustrated by the hawkmoth genera *Compsulyx* in New Caledonia (Fig. 1) and *Batocnema* in East Africa-Madagascar (Grehan & Nielsen 2014).

The two genera are members of the tribe Ambulycini, a widespread group in the Old and New Worlds, and yet notably absent from most of Africa (outside eastern Africa and Madagascar), northern Eurasia, North America mostly north of Mexico, New Zealand, and nearly all of Australia (Fig. 2). *Compsulyx* is located near the distributional boundary of the widespread east Asian genus *Ambulyx*, and it would be no surprise if they were sister taxa, but this is not the case. The sister group of *Compsulyx* was identified by Timmermans *et al.* (2019) as *Batocnema* of Madagascar and nearby central-eastern Africa. The two genera were together found to be the sister group of *Protambulyx* in the New World. The next sister group is another New World clade (*Orecta, Adhemarius, Trogolegnum*), followed by *Ambulyx-Amplypterus* of southern-eastern Asia (Fig. 2).

Timmermans *et al.* (2019) assigned a center of origin for the tribe in tropical South-East Asia as this was

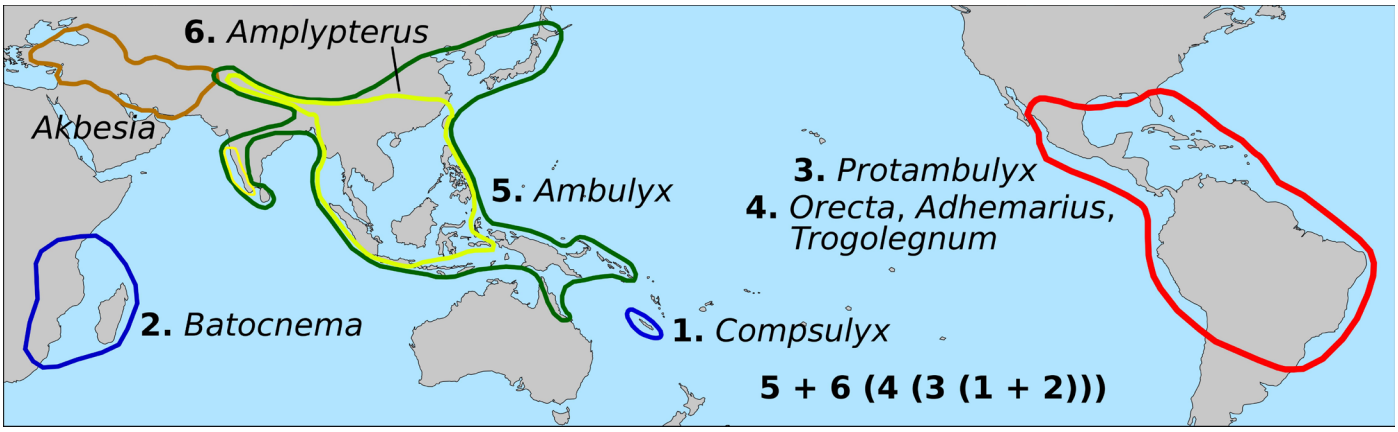

Fig. 2. Distribution of Ambulycini hawkmoths (from Grehan & Nielsen 2024).

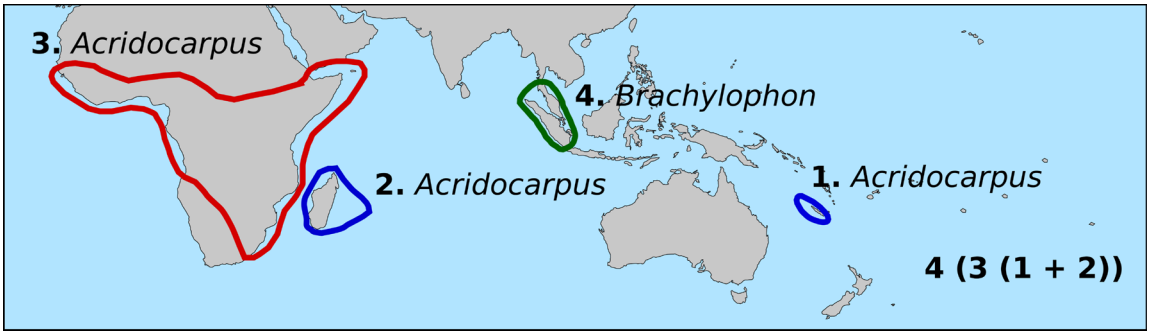

Fig. 3. Distribution and phylogeny of *Acridocarpus* and its sister genus *Brachylophon*. From Grehan & Nielsen (2024).

where the smaller 'basal' clades are located. They then found themselves 'unclear' as to whether there were two independent dispersal events to the New World, a single dispersal followed by a return trip, or even a 'more complex scenario'. Their principle finding was that the distribution of Ambulicyni represented an enigmatic discrepancy.

Timmermans *et al* (2019) did not consider the possibility that vicariance could be responsible for the *Compsulyx-Batocnema* disjunction. Grehan & Nielsen (2024) noted that similar patterns of distribution and phylogenetic relationships in other taxa can represent corroborating evidence for vicariance. For example, the plant genus *Acridocarpus* (Malpighiaceae) has sister species in New Caledonia and Madagascar/Mauritius (Fig. 3).

Other corroborating examples include the plant genus *Cunonia* (Cunoniaceae) of New Caledonia and the Western Cape region of South Africa only, the plant genus *Dietes* (Mapigaceae) with a sister species relationship between Lord Howe Island and East Africa, the palm genus *Oraniopsis* (Ceroxyleae) occupying a small, 'island-like' area of continental Australia that together with *Ceroxylon* of the northern Andes and *Juania* of the Juan Fernandez islands, is the sister group of *Ravenea* in Madagascar and Comoros (Grehan & Nielsen 2024 and references therein). The palm tree clade comprising *Ixerba* and *Strasburgeria* in northern New Zealand and New Caledonia respectively, is the sister group of *Aphloia* in Madagascar and adjacent east coast of Africa, and *Geissoloma* of South Africa (Heads 2010). The scarab beetle tribe Hexodontini with *Hemicyrthus* of New Caledonia, *Hexodon* in Madagascar and *Hyboschema* in South Africa (Dechambre 1982, Krell *et al*. 2015) may represent a further example, pending future phylogenetic confirmation (Alberto Ballerio pers. comm.). Indian Ocean disjunctions are diverse and prolific to say the least (Craw *et al*. 1999, Heads 2014a). The *Compsulyx-Batocnema* disjunction only stands out because New Caledonia is a small area geographically isolated from the Indian Ocean by continental Australia.

Taxa that are disjunct across the Indian Ocean, but absent from Australia, such as the Ambulicyni hawkmoths, may be attributed to extinction as is sometimes evident by the presence of fossils only, for extant taxa. But it is also possible for most or all of Australia to have been 'bypassed' if the ancestral distribution between Africa/Madagascar and the western Pacific regions such as Zealandia extended across East Antarctica (Fig. 4). This eastern Antarctic connection is not the center of origin-chance dispersal theory that relegates Antarctica to a chance dispersal land-bridge. Instead, the continent is recognized as having had a diverse biota that included taxa widespread over parts of southern Gondwana while also entirely or largely absent from other parts such as that region now comprising continental Australia (Heads 2014a).

Centre of origin-chance dispersal approaches to Lepidoptera biogeography are certainly popular. Probably this is a combination of historical precedent, beginning with Darwin's (1859) invocation that anything else was to call upon a miracle, and the development of various automated (plug and play) recipes (e.g. BioGeoBears: Matzke 2013) that require no comparative knowledge. Just make up some areas and relate them to the given phylogeny. With this approach there is no need to understand geology and tectonics, or understand how any one taxon distribution may be related to any other in genera (Heads 2014a).

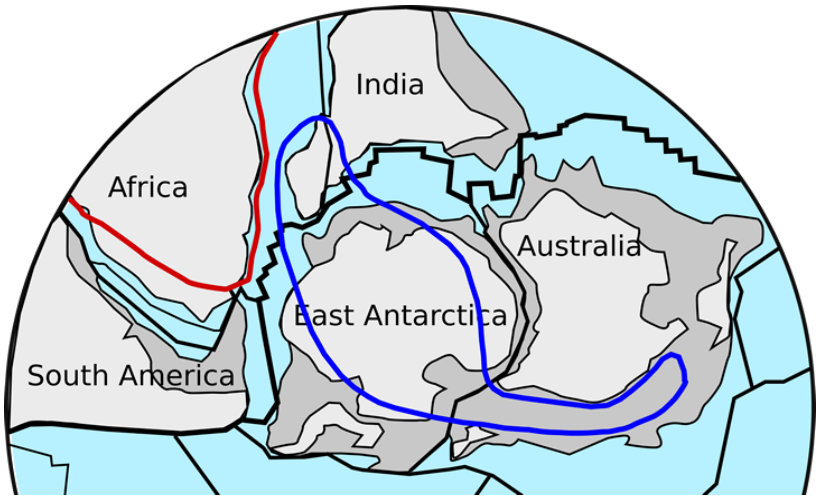

Fig. 4. Conceptual illustration of widespread ancestral range (blue outline) of taxa such as the *Compsulyx-Batocnema* clade of Africa/Madagascar and New Caledonia via East Antarctica where Australia may be marginally occupied or bypassed. From Grehan & Nielsen (2024).

There is no empirical evidence for identifying a center of origin where the sister group is found, either for the Ambulycini hawkmoths or any of the other taxa presented here. This association is only one of 13 (sometimes contradictory) arbitrary criteria invented for identifying an imagined centre of origin. According to Cain (1943), the assumptions involved in identifying a center of origin have, in many instances, "so thoroughly permeated the science of [bio]geography and have so long been a part of its warp and woof that students in the field can only with difficulty distinguish fact from fiction."

What often comes out of center of origin-chance dispersal biogeography is a smorgasbord of 'unclear' and 'complex scenarios', 'enigmas', 'discordant elements', and 'discrepancies'. Biogeographers are left with 'perplexing' questions and 'puzzles'. Center of origin-chance dispersal molecular studies cannot provide coherence in biogeography because everything is reduced to 'chance' (Heads 2014b). Because everything is chance, the actual geography of clades is not seen to be informative, other than as a few artificial area units plugged into vicariance-dispersal programs. It is as if the real geography of distribution is the enemy of biogeography. One might as well throw some dice.

In contrast to the confusion of center of origin theory, the Madagascar-New Caledonia disjunction of the Ambulycini hawkmoths is fully consistent with allopatric divergence within the range of a widespread ancestor. This is falsified neither by calibrated divergence estimates that represent minimum ages of taxa, nor by ancestral areas analysis that relies on non-empirical chance dispersal between non-empirically existent biogeographic areas. Ambulycini biogeography is not an accident of 'chance' but an integral part of the global structure of biodiversity. For these moths, Earth and Life evolved together.

In response to the Grehan & Nielsen (2024) study, a colleague of mine in the conventional (center of origin-chance dispersal) field of Lepidoptera biogeography said alternative interpretations of distributions, alternative models, and critiques of existing papers is healthy for the development of scientific ideas. The problem of fossil calibrated molecular ages being minimum estimates only was first recognized nearly two decades ago (Heads 2005), and 66 years have passed since biogeographic evidence first showed that biodiversity has global structure that is inconsistent with the assumptions of center of origin and chance dispersal biogeography (Croizat 1952). The molecular biogeographic literature on Lepidoptera origins has almost entirely overlooked these issues and has not been able to address the empirical foundations of its methodology by directly evaluating actual patterns of phylogeny mapped onto distributions. This pervasive oversight continues to undermine the scientific health of Lepidoptera biogeography. Hopefully future studies will rectify this situation by directly addressing alternative biogeographic evidence.

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Tucker Cooley and Ric Peigler at the 72nd Lep Soc Meeting at Cornell University, Ithaca, New York. Image by Ric Peigler.

Life history notes on the Common Mellana *Quasimellana eulogius* (Hesperiidae: Hesperiinae) in the lower Rio Grande Valley of Texas

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Previously described as a rare stray to south Texas from Mexico (Scott, 1986), later as a regular stray (Brock and Kaufman, 2003), *Q. eulogius* (Figs. 1-4) appears in recent years to have established itself as a breeding resident in the LRGV. Burns (1994) removed *eulogius* from *Mellana*, assigning it to the new genus *Quasimellana*, characterizing it as a "weed species", common and widespread, ranging from Cameron and Hidalgo counties south to Brazil, Bolivia, and Paraguay. Brock and Kaufman state the foodplant is unknown.

The senior author first collected and reared *Q. eulogius* in the LRGV in November 1995. Subsequently, females were observed ovipositing on *Panicum maximum* (Poaceae) south of Mission Hidalgo County. Females collected near Mission 25 October 2022 oviposited in confinement on *P. maximum*. The junior author reared the caterpillars issuing from those eggs for this study.

DESCRIPTION OF IMMATURE STAGES

Ova (Figs. 5-6). Semi-hemispherical; cream color when deposited. Developing eggs form 2 red concentric rings. Red fades and larval head becomes visible through chorion as caterpillar nears eclosion.

Neonate (Fig. 7). Body pale. Head and prothoracic shield black. 2 brown setal bumps just below prothoracic shield on each side.

First instar (Fig. 8). Body greenish white on dorsum, becoming yellowish green in spiracular region. Faint striping.

Second instar (Fig. 9). Body yellow-green with numerous small dark setal bumps. Head brown with darker stripes along middorsal suture and on each side of frons.

Third instar (Fig. 10). Body green with whitish wash in subdorsal and subventral regions. Head marked as in previous instar, but lighter brown.

Fourth instar (Fig. 11). Body with strong white cast overlaying green. Head as previous instar.

Fifth instar (Fig. 12). Body cast now yellowish; green visible through integument folds gives banded appearance.

Pupa (Fig. 13). Formed in shelter on host plant. Medium brown, covered in white powder. Pictured pupa was cleaned to show surface structure.

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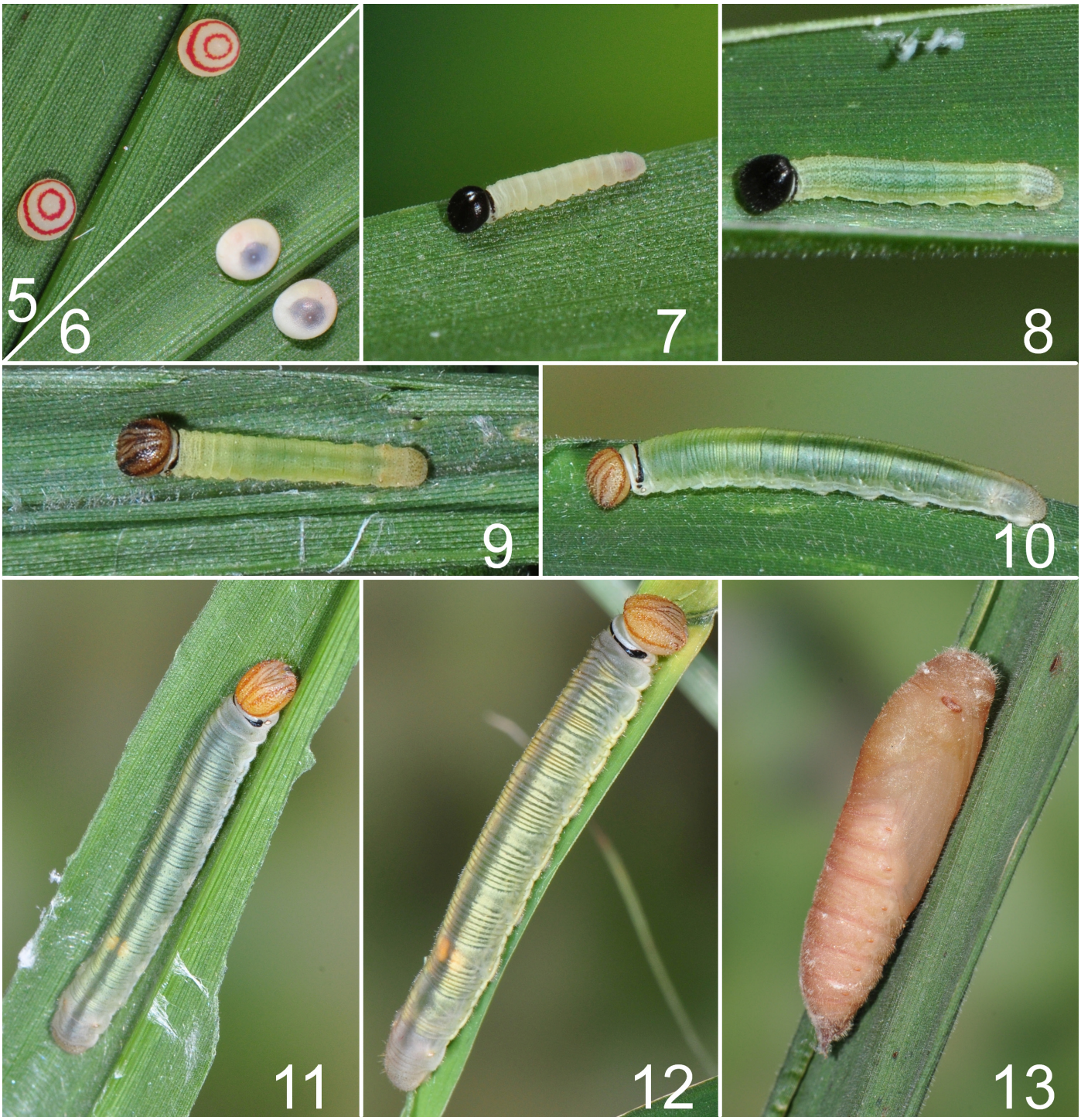
Figures 1-4: adult *Q. eulogius*. **1-2** Male, ex ova, emerged 20-12-22; **3-4** female, Roma Bluffs WBC, Roma, TX, 24-10-08.



Figures 5-13: Immature stages of *Q. eulogius*. **5** Developing ova; **6** ova nearing eclosion; **7** neonate; **8** first instar; **9** second instar; **10** third instar; **11** fourth instar; **12** fifth instar; **13** pupa.

Confirming predicted presence of *Phassodes* ghost moth on Vanuatu (Lepidoptera: Hepialidae)

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In contrast to all other Hepialidae, the distribution of *Phassodes* is confined to landscapes that are entirely volcanic in origin on the islands of the Solomon archipelago, Fiji, Samoa, and American Samoa. The origin of this distribution was attributed by Grehan & Mielke (2018, 2020a, b) to the ancestor occupying islands that became isolated from continental East Gondwana about 90 Ma due to slab rollback that moved the subduction zone northeast (Vitiaz Arc) and eastwards into the Pacific. This tectonic displacement separated the *Phassodes* ancestor from *Abantiades* of Australia that represents the probable sister group (suggested by shared morphological features).

The Vitiaz subduction zone stalled about 15-10 Ma when it collided with the westward moving Ontong-Java magmatic plateau. About 5 million years ago a part of the Vitiaz Arc now comprising Fiji and Vanuatu was displaced south and southwest by the newly opened .North Fiji basin. Since Vanuatu originated along the Vitiaz Arc, the presence of *Phassodes* in the Vanuatu archipelago was predicted by Grehan & Mielke (2018), assuming populations were able to survive in that region.

The presence of *Phassodes* on Vanuatu was confirmed by photographic records made by DMR and published on iNaturalist[1]. Initially, a single moth (Fig. 2a-b, d-e) was found on South-West Tanna Island, 3.5km inland at an altitude of 120 masl, next to the village of Imapul. It was observed at the beginning of July at 10PM during a partly cloudy night, a few days after the new moon. The moth was found resting on a mandarin tree *Citrus* × *reticulata* Blanco (an introduced species to Vanuatu) at height about 3m above the ground sitting on leaves close to the apex. The habitat was a highly disturbed village/garden edge with secondary growth with mandarin trees interspersed with *Morinda citrifolia* L. and *Urena lobata* L. The ground is occasionally grazed by goats and is covered by different grasses, especially *Stenotaphrum secundatum* (Walter) Kuntze. The surroundings were searched for the pupal exuvium without success. The moth had an appearance of a freshly hatched individual.

Three days after the first find, a second trip to the same area made by DMR, resulted in another individual some 300m from the original site. It was clinging to low vegetation on the edge of secondary growth between gardens. This specimen was a female at the end of its lifespan, much of the wing surface being worn and presenting much less vivid colors (Fig. 2c). It was in the process of laying eggs and died shortly after. The eggs were pale white before changing to black – a general characteristic of Hepialidae.

Both individuals are immediately recognizable as *Phassodes* due to the unique forewing wing pattern, along with the presence of the forewing gland (otherwise only seen in *Palpifer* of eastern and southern Asia). The labial palps are prominent (Fig. 2d). While this evidence of *Phassodes'* presence in Vanuatu may be new for western science, it is by no means new to the local people. Elders and local experts of Imapul community (Nahual language area) - Kasékasé, Tom Kota and Toata Hauan shared with us that this moth is known as *iapat i nalau asul* in Nahual

1 **https://www.inaturalist.org/observations?place_id=7082&taxon_id=1007908&user_id=dominik_ramik**

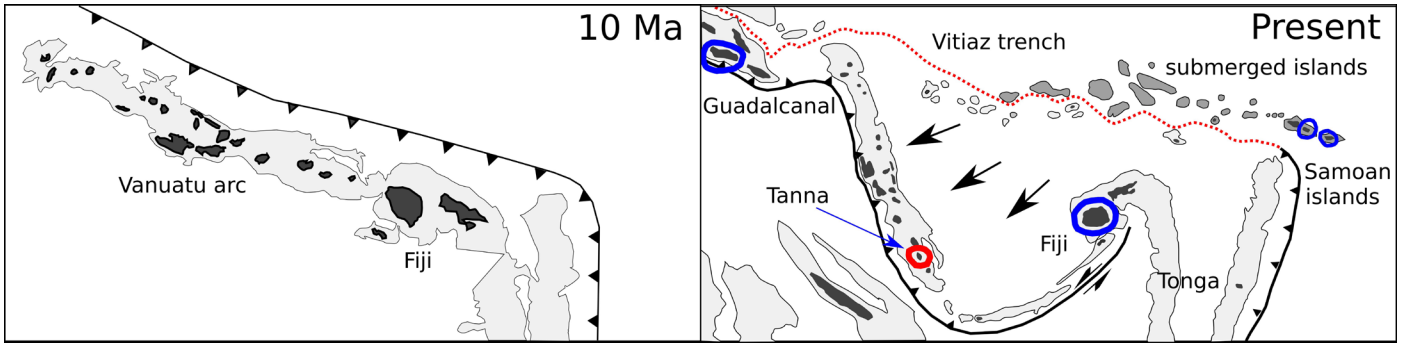

Fig. 1. Original location of the Vanuatu arc ~ 10 Ma and present day (modified from Buys et al. 2014). Current records of *Phassodes* in blue (modified from Grehan & Mielke 2020) and red (the new find) outline.

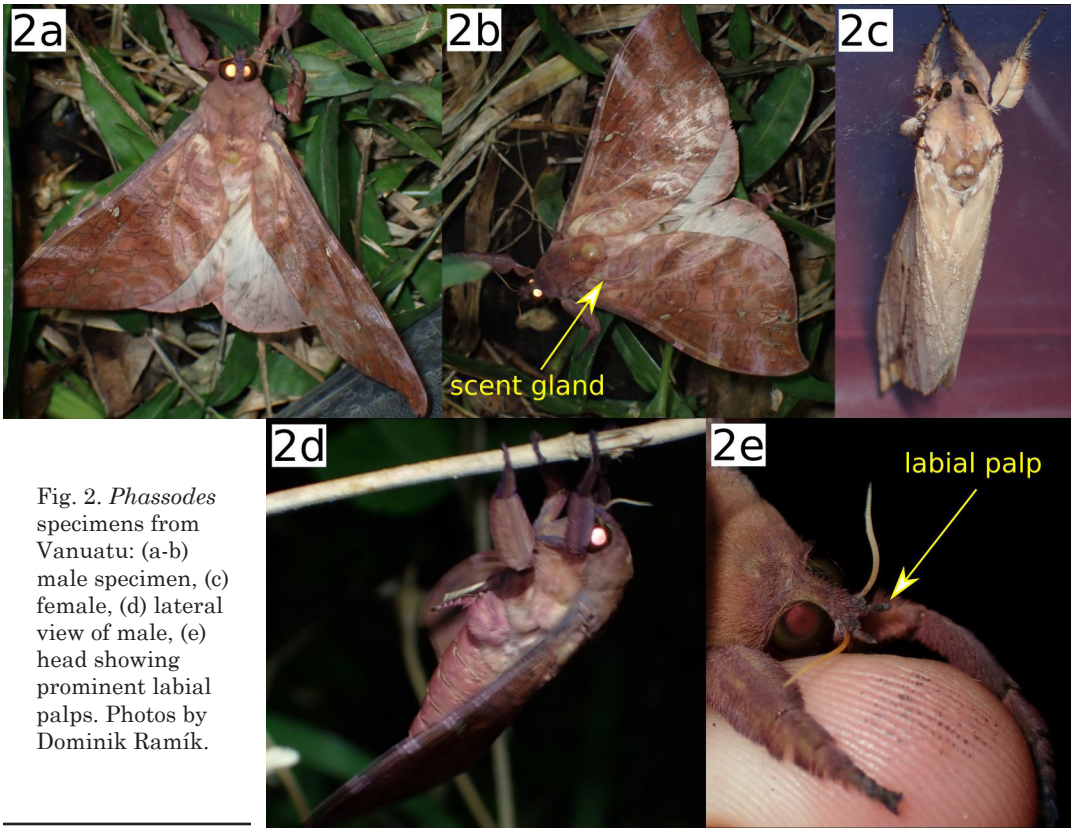

Fig. 2. *Phassodes* specimens from Vanuatu: (a-b) male specimen, (c) female, (d) lateral view of male, (e) head showing prominent labial palps. Photos by Dominik Ramík.

(lit. "the large *iapat* of *nalau*", *nalau* being an important traditional variety of yam). This name is shared with another moth species, *Phylodes imperialis* (Erebidae), which belongs to the folk taxonomic family of *iapat i nalau* that inlcudes all Calpinae and a few other genera of large moths.

The cultural importance of *Phassodes* lies in its connection to traditional garden practices (as its local name suggests by evoking yams). It is said to help the *tupunus* (people specializing as garden magicians) ensuring an abundant crop, and as with any other *iapat i nalau*, it is taboo to needlessly harm it as this could have negative effect on the crop. The appearance and hatching of the pupa of *Phassodes* is also recognized as an ecological calendar sign showing the time of the year when yams should be planted into new garden's *tow* (earth mounds). This is complementary to other, mostly plant-based calendar signs followed by the local people (Balick et al. 2023).

The islands of present-day Vanuatu comprise volcanic and limestone formations dated as late Eocene to Present. This does not mean that the age of its biota date from the Eocene, as they could have colonized the islands from former islands in the immediate vicinity. This is known as metapopulation persistence and allows island taxa to survive for tens of millions of years within a locality or local region, even though there may be no permanent land throughout that time (Heads 2018). The Solomon Islands-Vanuatu-Fiji arc developed near the original Pacific arc that is marked by the Vitiaz trench. The original arc developed at the coast of Gondwana and would have been colonized, at least in part, from that region. Buys et al. (2014) suggest that the presence of Archean-Cretaceous zircons is evidence that part of Vanuatu arc basement comprises continental material representing a continental ribbon that was rifted and transported thousands of kilometers from northeastern Australia prior to the Cenozoic.

Most islands in this complex history have subsided, subducted or been buried under subsequent volcanism. In Vanuatu there is active volcanism on Tanna, while further north a large island disappeared in historical times. The system is dynamic, with islands appearing and disappearing, even over ecological time scales. Organisms that can colonize new strata and islands in their vicinity by normal, local, ecological dispersal will persist in the region as long as volcanism continues (Heads 2014, 2018) The process will also entail the extinction of many lineages with unsuitable ecology, but *Phassodes* is one lineage that has been able to survive. Future questions about its distribution include whether the genus is more widespread in the Vanuatu archipelago and the Solomon Islands archipelago, and whether the genus may even be present in the Bismark archipelago where no species of Hepialidae are yet recorded.

The prediction of *Phassodes* in Vanuatu was based on the biogeographic method of tectonic correlation. This utilizes the fact that distribution patterns correspond spatially with tectonic structures. This provides the empirical basis for a historical relationship between the origin of a distribution and tectonic features such as faults, folds, suture zones, subduction zones, spreading ridges and many others (see Heads *et al.* 2023for Coenonymphina butterflies). The tectonic correlation between *Phassodes* records and the Vitiaz Arc was identified by Grehan & Mielke (2018, 2020a) and led to the prediction that the Vanuatu region could support a *Phassodes* populations, as it represents a displaced fragment of the former arc. The Vitiaz arc did not include New Caledonia, and this explains why *Phassodes* is absent from the intensely collected region of New Caledonia despite the short geographic

distance from Vanuatu. This represents a further example of how the biogeographic-tectonic correlation approach represents a progressive research program *sensu* Lakatos (Craw & Weston 1985), predicting new facts that are subsequently confirmed by independent research (in this case, documentation of the new record).

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Membership Updates

Chris Grinter

Includes ALL CHANGES received by August 19, 2024. Direct corrections and additions to Chris Grinter, **cgrinter@gmail.com.**

New Members: *Members who have recently joined Lep Soc, e-mail addresses in parentheses. All U.S.A. unless noted otherwise.* (*red. by req. = address redacted by request*)

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Felix Sperling, Ivonne Garzón, and Jason Dombroskie at the 72nd Lep Soc Meeting at Cornell University, Ithaca, New York. Image by Jean-François Landry.

Lepidopterists visit Hong Kong and the People's Republic of China in 1993

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In April of 1993, I received a letter that a delegation of butterfly specialists and enthusiasts was going to travel to China under the auspices of the Citizen Ambassador Program of People to People International. The purpose was to meet and interact with members of the Chinese scientific community interested in butterfly systematics, evolution, ecology and conservation. A follow up letter stated that delegation members would be allowed to observe and collect butterfly specimens and participate in various meetings and presentations.

On June 16, 1993, I flew to Los Angeles where I met the delegation leader, Dr. Phil DeVries and other delegates including Mr. Colin Treadaway. Colin, better known as Trig was born in Christchurch, Hants, England in 1923, became interested in butterflies at age three, and by 1993 was an Honorary Member of the Senckenberg Research Institute and Natural History Museum, Frankfort, Germany. Over his 96 years, Trig published over 100 papers primarily about butterflies of the Philippines, covering over 300 holotypes -- see https://neergaard.org/CGTGenealogy/Narratives/CGT/ColinGuyTreadawayHoare.html. During the trip I often relied on Trig's expertise and kindly manner that continued for many years through an exchange of Christmas cards and letters up until his death in 2019.

On Thursday, June 17, the delegation was briefed by John Jessup of People to People International about cultural differences and other practicalities we could expect during our time in China. He also said that our delegation was smaller than most but by far the most interesting he had ever encountered.

The 14-hour flight from Los Angeles to Hong Kong on Cathay Pacific took us up the west coast of North America, across the Gulf of Alaska, the Aleutians, the International Date Line, along the Kamchatka Peninsula, Japan and Taiwan before landing in Hong Kong. The following morning, the delegation met Professor Shigeru Ae of Nanzan University, Nagoya, Japan who specialized in the ecology, genetics and hybridization of butterflies, Dr. Takuhei Murase, Toyota Memorial Hospital, Toyotashi, Japan, Steve Collins, Area Manager agrochemical division of Monsanto Central Africa, Nairobi, Kenya and Glenn Ping, from Begawan, Brunei.

On June 20, the delegation was bussed to the home of Austain Ballentine and his wife in the New Territories where Austain had suspended a bait trap with fermented fruit to attract butterflies and other insects.

Austain Ballantine lowers a bait trap as Steve Collins, from Kenya, Africa (left) and Phil DeVries (rear) look on.

Though not accustomed to the heat and humidity of Hong Kong I spent much of the afternoon collecting butterflies including common species that were new to me. The Ballantines' young daughter loved chasing large swallowtails such as *Chilasa clytia, Graphium agamemnon, Graphium doson, Graphium sarpedon, Papilio memnon, Papilio helenus* and *Papilio protenor*.

Professor Shigeru Ae (foreground) and Dr. Takuhei (Tak) Murase, New Territories, June 20, 1993.

An enthusiastic young lepidopterist.

On June, 21 the delegation boarded a China Southern flight for Kunming in Yunnan Province where we were met by Professor Zhu Yanan of the Chinese Academy of Science and Technology plus two local Chinese hosts who spoke excellent English. At the Golden Dragon Hotel in Kunming I exchanged U.S. money for Chinese currency. In 1993, the Golden Dragon was a modern hotel as were nearby shops and stores but cars were rather uncommon and the majority of people got around by bicycle.

Morning rush hour, Kunming, China, June 21, 1993.

On June 21, we attended our first formal banquet which consisted of at least ten courses including eel, grass carp, jellyfish, and other exotic dishes. After several toasts thanking our Chinese hosts and wishing them everlasting friendship, Phil presented our hostess from the Chinese Academy of Science a copy of his book, "The Butterflies of Costa Rica", as a gift from the delegation.

On June 22, the delegation visited the Kunming Institute of Zoology that had excellent displays of insects, amphibians, reptiles, birds and mammals from different Chinese Provinces. Later that afternoon, on a flight to to Jinghong in southern Yunnan Province, we were required to fill out a special permit in order to enter Xishuangbanna, a region close to the borders of Myanmar and Laos where in 1993 travel was restricted due to smuggling. Today, Xishuangbanna is a major tourist destination that does not require a special permit to visit. On June 23, our first stop, after crossing the Mekong River in Jinghong, was the Sanchahe Butterfly Farm where we toured the facilities that were used to rear local butterflies for sale to collectors and local artists.

Not sure of our intentions, a guard keeps a close eye on Trig and Glenn Ping at the Sanchahe Butterfly Farm, June 23, 1993.

Today, the 900 acre Sanchahe Nature Reserve is home to wild elephants, hosts a Butterfly farm, a cable car that offers breath taking views and an overnight stay in a tree-house -- see https://www.yunnanadventure.com/index.php/Attraction/show/id/318.html. In recent years, camera traps in Xishuangbanna, Tongbiguan and Gaoligongshan in Yunnan have captured photos of the threatened Clouded Leopard -- see https://www.kfbg.org/en/KFBG-blog/post/A-clouded-future-The-secretive-clouded-leopard-is-pushed-to-the-brink-by-deforestation.

Delegation members arrive at the Tropical Botanical Gardens, Menglun, Yunnan.

Before arriving at the Jinghong Nature Reserve, we passed through a dense subtropical forest where birdwing butterflies (*Troides* spp) were seen. Later we checked into our rooms at the Banna Hotel, part of the Menglun Tropical Botanical Gardens. As hotel windows lacked screens, we slept under mosquito netting suspended over the beds.

On June 24, members of the delegation searched for butterflies in a forested area near a Dia village where we encountered a local farmer who sold butterflies collected by he and his wife. On the way back to Kunming, we stopped near a canyon where Steve and Trig collected more than 15 species of butterflies.

On June 27, we flew to Haikou, Hainan, an island province off the coast of Vietnam in the South China Sea where the objective was to visit the Jianfengling Nature Reserve inland from the southwest coast of Hainan, a trip that required two days. On the morning of June 28, 17 delegates plus a driver and two Chinese guides crowded into a small minivan for the trip to an overnight stop in Ledong City. The central and southern part of Hainan is mountainous and the roads steep and winding which made for an exciting and sometimes dangerous eight hour trip. At one stop, Glenn Ping noticed several male common birdwing butterflies patrolling in the canopy of trees where females would likely be near Aristochiaceae vines, the larval host plant. Glenn placed paper models of female *Troides helena* he had made near the ground which soon attracted several males. In late-afternoon we arrived at the Ledong County Hotel where a large crowd of youngsters had gathered. Our guide Yuan explained that due to the close proximity to Vietnam and past border disputes, the Chinese government had opened the region to outsiders only five years earlier and we were likely the first group of Westerners these young people had ever seen.

We were likely the first group of westerners these young people had ever seen, Ledong City, Hainan, June 28, 1993.

Youngsters look on as Richard Brown (left), Mark DuBois, Shigeru Ae and Colin (Trig) Treadaway search for butterfly larvae.

After breakfast on June 29, we boarded the minivan where a crowd had gathered to see us off on the trip to the Jianfengling Nature Reserve. As we approached the southwest coast of Hainan, a large mountain range was visible to the northwest. Following a briefing at the reserve headquarters we were driven to the Mt. Tianchi Hotel. Established in 1992, the Jianfengling Nature Reserve hosts more than 2,839 species of plants, eight vegetation types including the largest example of subtropical rain forest in China (https://forestgeo.si.edu/sites/asia/hainan), 215 species of birds (http://www.alpinebirding.com/Resource/bird-info/provincial/13.html), 68 mammals (http://www.rambling aroundhainan.com/chapter-11--west-coast--ledong-to-dongfang.html) and an unknown number of invertebrate species. It should be noted that Hainan, principally the Bawangling Reserve, north of the Jianfengling Nature Reserve, hosts a small population of the extremely endangered Hainan Gibbon, estimated to be 37 1n 2023.

Following negotiations the previous evening between Phil and local Chinese that involved additional payment (a practice to be repeated the following several days), we were allowed to enter the "no-cut" zone of the reserve in search of butterflies. Richard Brown, Tak and I rode in a jeep up a steep and deeply eroded road that was nearly washed out in places and I wondered if we would make it. We spread out along a trail surrounded by lush ferns, dawn redwoods, and immense trees that formed a dense canopy. Where the road ended, Trig and Steve set up four bait traps to attract forest nymphalid butterflies. As few butterflies were observed along the deep shade of the stream bed, some hiked back while I was left to monitor the bait traps. Numerous butterflies were seen high in the canopy of flowering trees but far out of my reach. A number of Jungle Queens, *Stichopthalma neumoegeni* were attracted to the trap but their cryptic aspect so well camouflaged them on the forest floor I was only able to capture one well-worn specimen. Later the jeep and a van driven by the

View of the Jianfengling Nature Reserve and Mt Tianachi, June 29, 1993.

Delegates enter the no-cut zone of Jianfengling Nature Reserve in search of butterflies, June 30, 1993.

reserve manager returned to take us back to the hotel and everyone was out of the forest by 5 PM. Steve, Phil, Trig and Professor Ae worked late on Wednesday, June 30 identifying specimens, a total of 172 species (list available from the author upon request) in two days compared to 160 species of butterflies compiled over the past thirty years.

Thursday morning, July 1, I hiked part way up a trail that led to a nearby ridge where butterflies were much more numerous than in the deep shade of the no-cut forest. Swallowtails, pierids and nymphalids were seen rapidly flying up and down the hillside that were likely males in search of females, a good example of hill topping behavior. Before noon the delegation was bussed to Sanya, a large city on the southeast coast of Hainan where we enjoyed a final banquet with toasts of friendship and presented gifts to our local host, Professor Huang Zongdao. Following the banquet, Phil, Trig, Tak and Professor Ae worked into the night going over our collections with Dr. Hue Dayong to secure permits for us to export specimens from China.

Upon arriving back home I pinned, spread and labelled specimens that I had collected. As not all had been identified while in China, I mainly relied on interlibrary loans to identify unidentified specimens. That worked well except for one that I never felt right about that I collected June 30, 1993 at the Jianfengling Nature Reserve on Hainan. In September of 2023, I decided to take another look and explore resources about China butterflies on the net and iNaturalist that were not available in 1993. After several days of searching butterflies of China (https://en.wikipedia.org/wiki/List_of_butterflies_of_China_(Lycaenidae) I came across a subspecies of the Falcate Oakblue, *Mahathala ameria hainani* that closely resembled my specimen. According to https://www.wikiwand.com/en/Mahathala_ameria, specimens of *Mahathala ameria hainani* are housed in the Naturhistorisches Museum of

Group photo of the delegates and Chinese guides at Haikou, Hainan, July 3, 1993.

Basel, Switzerland and three others at the British Museum of Natural History (https://data.nhm.ac.uk/search). I next contacted the Naturhistorisches Museum of Basel, Switzerland, for further information and soon received a reply from Isabelle Zürcher-Pfander, Manager of Collections, that stated "Dr. Klopfstein asked me to send you the required information from our Collection. We can confirm the specimens are from our Courvoisier collection." In 1903, George Bethune-Baker described *Mahathala hainani* as a new species from Hainan, China (https://www.biodiversitylibrary.org/item/32625#page/33/mode/1up) and later as a subspecies of *Mahathalma ameria.* Four subspecies of *Mahathalma ameria* have been described: *M. a. ameria* - West China, Bengal, Assam, Burma; *M. a. zistra* Fruhstorfer, 1908 - Thailand; *M. a. javana* Fruhstorfer, 1908 - Java; and *M. a. hainani* Bethune-Baker, 1903 - Indo China, South China, Hainan and Taiwan (https://en.wikipedia.org/wiki/Mahathala_ameria). The National Check list of Taiwan (https://www.gbif.org/occurrence/search?taxon_key=6132663) lists 163 records of *Mahathala ameria hainani* from Taiwan plus one from Wuyi Shan, Fujian, China, Museum of Nature and Human Activities, Hyogo Pref. Japan; one from Jiulianshan, Guangdon, two from Fujian Province, China (at the Harvard Museum of Comparative Zoology) but none from the island of Hainan. iNaturalist lists two 2022 photo records fromHainan as the Falcate Oakblue, presumably *hainani* (https://www.inaturalist.org/places/hainan#q=falcate+oakblue). There may be others, but to the best of my knowledge, the specimen of *Mahathala ameria hainani* I collected in 1993 is one of only nine known from the island of Hainan, China.

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Five specimens of Mahathala ameria hainani, bottom, third column from the left, Courvoisier collection, © Naturhistorisches Museum of Basel, Switzerland.

Left: Female specimens of Mahathala hainani from Hainan, described by George Bethune-Baker in 1903, © Naturhistorisches Museum of Basel, Switzerland. Right: *Mahathala ameria hainani* collected by the author June 30, 1993, Jianfengling Nature Reserve, Hainan, China.

Black Swallowtails exhort in manifold limb transformations

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When I was a youngster of 8 & 9 my attention to wildlife turned to butterflies as Mom & Dad were cultivating a flower garden out back. Our new home in Englewood, New Jersey lay on the western slope of the Palisades, only a short ten minutes from the George Washington Bridge, easy access by subways to The American Museum of Natural History and midtown New York. Repeated visits there sparked my desire to learn all about insects. Time and again I perused the insect hall, teaming with diversity, magnified models of bees, wall mounted silk moths with various *Antheraea* species, and a special colorful drawing of a Luna Moth pupa inside a cocoon; what meticulous drama. The gift shop on the ground floor just to the side of Alaska's giant brown bear provided intriguing books and bronze models of dinosaurs, that make great paper weights (now long out of stock). Today it is replaced by the very fine living butterfly hall; if only there had been room for both exhibits. Adjacent to the lobby is the Hall of North American Forests. In the initial diarama was a tree with a mounted Cecropia Moth and its cocoon; That triggered my searching open fields and railroad margins for live cocoons. I was thrilled to find one spun up on a bramble bush that later emerged indoors as my first awesome Cecropia! That vacant overgrown lot gone to benign weedy neglect is now macadam & condominiums. Go to YouTube for a discourse on the Cecropia Moth with Tor Hansen.

Natural History magazine ran ads for kits for a budding entomologist, and before long a package arrived at our door with my first green fine gage short handle net plus papered specimens, spreading boards, and mounting & glass headed pins! Like a key that sprang a lock, I was off and running to net butterflies and whatever insect I could catch and mount, to prepare a collection of all orders. By 11 years of age I had collected most of the various orders and local species from lacewings & dragonflies to beetles & butterflies, filling empty cigar boxes to overflowing. Swooping the net over bramble yielded torn nets needing replacement.

With time, purchases of riker mounts and display cases enabled the beauty & unique profiles to be expressed and savored. Empty peanut butter glass jars provided the best killing jars, once I learned how to pour plaster of paris for the base for absorbing carbon tetrachloride. But after a while I grew tired of capturing and watching the agonizing death of still more insects to make a significant sample of each species, so imperative to professional standards. Abruptly my younger brother Bjorn warned me to stop the killing. I did. Today I rear caterpillars to moths, photograph them in nature's garden and highlight their metamorphic changes into DVDs for education. Seldom do I take a life, for example the Black Swallowtail so nimble in flight and captivating while sipping nectar at an oasis.

Another important influence in my development as an entomologist came about when I found a back issue 1965 of DU Magazine printed in Germany with a large color prints including a *Charaxes* butterfly. An informative article featured great detailed photographs of assorted species including the Brimstone (*Gonepteryx rhamni*; family Pieridae) and its intriguing yellow & pink chrysalis, so leaflike, and the Zebra Longwing heliconiid, close up of larvae hatching from eggs, and an *Antheraea* Silk Moth. That set the stage for more studies in metamorphosis thereafter. Years later I became interested in rearing arvae from eggs *Antherarea pernyi* sent through The Market Place, Lep Soc News, by P.T. Chang from China, and later eggs of *A. harti* from England courtesy Gareth King. A photo essay of cross-breeding the two species is found in the issue of the Lep Soc News, fall 2020. My persistent attention to details was highlighted by my brother Erik Hansen, who became a successful commercial photographer, specializing in dramatic lighting with strobes to illuminate the molting larvae. Thus in my article "Mirror Cloth Silk Moth " I was able to accentuate the wonder and intense labor involved in silk production or sericulture.

The best example of my involvement with *Papilio polyxenes* came during the summer of 1962 when, as a sophomore at Dwight Morrow High School Englewood, I suggested to Casper Hill PhD., my biology teacher, in order to fulfill requirements to complete the course, that I would draw a plate to illustrate larval metamorphosis, to be submitted the following fall for completion. Knowing my skills in drawing he urged me show the various instars for my special project. At our summer place in Truro Cape Cod I found caterpillars feeding mostly on Queen Anne's Lace and Parsley. I was so proud of my exacting detailed rendering in colored pencil, and the information gained in eyewitness molting, shedding the skin or ecdysis, and Dr. Hill was quite pleased with results. Unfortunately the plate was lost in the shuffle during forthcoming years; sadly there is no way to share the intricate changes depicted in larval morphology (figures 1 - 4).

Nothing short of miraculous is the transformation of manifold appendages of larva to butterfly in the metamorphosis of *Papilio polyxenes* our Black Swallowtail.

Figures 1-4. 1) *Papilio polyxenes* female imbibing at *Asclepias tuberosa*. 2) Fertile female ovipositing. 3) Black Swallowtail egg laid on Queen Anne's Lace. 4) 5 Instars of *P. polyxenes* larva growth stages.

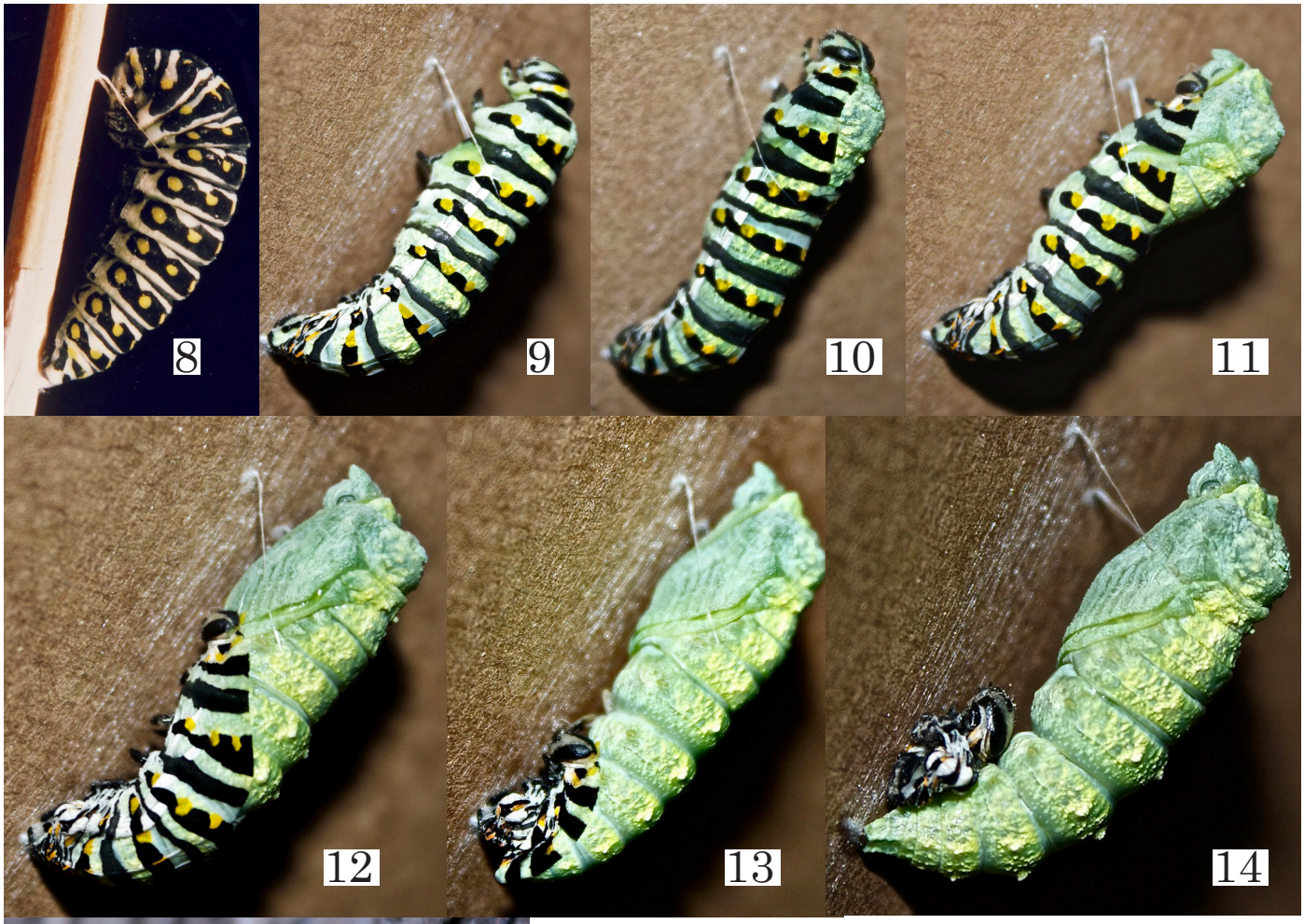
Searching the garden grown parsley may reveal a female ovipositing eggs, or the black & green banded larva dotted with bold yellow spots suggesting aposematic behavior. Note the ten fleshy prolegs complete with tiny hooks (crochets) for gripping, two per segment, so adept at grasping a stem when the larva bends over backwards to feed, or relinquishing its grip during the forward shuffle. These ten will be lost and absorbed during molting into the pupa. Located near the head are the six true segmented short legs that will become the long spindly legs of the butterfly, complete with hooked tarsal toes, transformed into small grappling hooks. You can observe this dexterous caterpillar changing form and overall congealing anatomy via the process of molting. Notice the fifth instar larva consuming most of its shedded skin, which begs the question "Does the larva gain invaluable protein and its own DNA help with the process of transforming into a pupa?" (figs. 5 - 7).

Figs. 5 - 7. 5) Black Swallowtail with osmeterium. 6) Black 5th instar larva feeding on shed skin. 7) Black 5th instar larva last meal on Queen Anne's Lace.

Having achieved the final feed, the plump larva undergoes specific internal changes involving synergistic hormones interacting with the cellular rearrangement or migration of protoplasm to reform what becomes revised organs and tissues. It seems something akin to rearranging furniture in a room in an adventure of interior decorating. Breaking down old legs and rebuilding new ones requires time and precise coordination, and is not spontaneous generation. Eventually the larva selects a suitable site where it will spin a small silk button, a cushion to which it will attach its tail segment via the crochets. Then the larva will position itself like an electrical lineman on a telephone pole, ready to hang out suspended by a belt, but first it must make a supportive silk strand, and slip inside it, wriggling until the girdle is set in place to support the forthcoming chrysalis through a long frosty winter! When the optimal hormone surge is underway, the new soft chrysalis within breaks open the old taught skin at the second thoracic segment, and in a manner of minutes you can see the white "tape lines" exude from the spiracles, and assist in shedding the skin down to the tail segment, where the cremaster will extract and jab a secure foothold on the silk button. That new generations survive up through time is evidence enough for us to exclaim what a feat for the tight instinctual ingenuity indeed! (figs. 8 - 15).

To watch the emerging adult break out of the dormant chrysalis is breathtaking to behold! When hormones, air warmth, and circadian rhythms (sufficient daylight hours) align, the eclosure is in motion. Monarchs and nymphalid chrysalids are positioned upside-down; swallowtail chrysalids are positioned heads up with a silk strand about the waste. New legs grapple for footholds, and limp wings unfurl with hemolymph pumped in arteries by the heart. Preformed wing scales, also new, swell to cloak the wings and assist in flight maneuvers. The maiden flight may take place in as little as 45 minutes (figs. 17 - 22).

Like their fellow Tiger and Spicebush Swallowtails, aerial courtship in mate selection of *P. polyxenes* is well developed and surprisingly enterprising. You can watch a pair encircle each other as they fly up & up, spiraling and tracing a crazy eight pattern in their acrobatic freestyle ballet! To and fro they flutter upside-down whirling and gyrating like two windblown pinwheels cavorting, their windswept wings askew at the mercy of the breeze, obliquely awry without a fastening frenulum. A second male may join in pursuit of engaging the lone female, and the threesome weave a dramatic display of outstretched wings and flashing colors. Soaring high above the nearest grandaddy willow towering 100 feet and more, the blacks all but vanish from sight and drift behind the foliage. On a different day, a separate event, I found a mating pair somewhat concealed in the grasses, where abundant Queen Anne's Lace and extensive milkweed crowned a meadow that stretched out a hundred yards across. On another day I returned to find the huge willow was split apart severely grounded by a lightning strike. Most of the ideal butterfly habitat was cut to make way for a landing pad for hang gliders riding the winds from a takeoff from Mount Greylock (elevation 3,491 feet) towering above the wildlife refuge preserved as Greylock Glenn Adams the Berkshires. Hopefully a

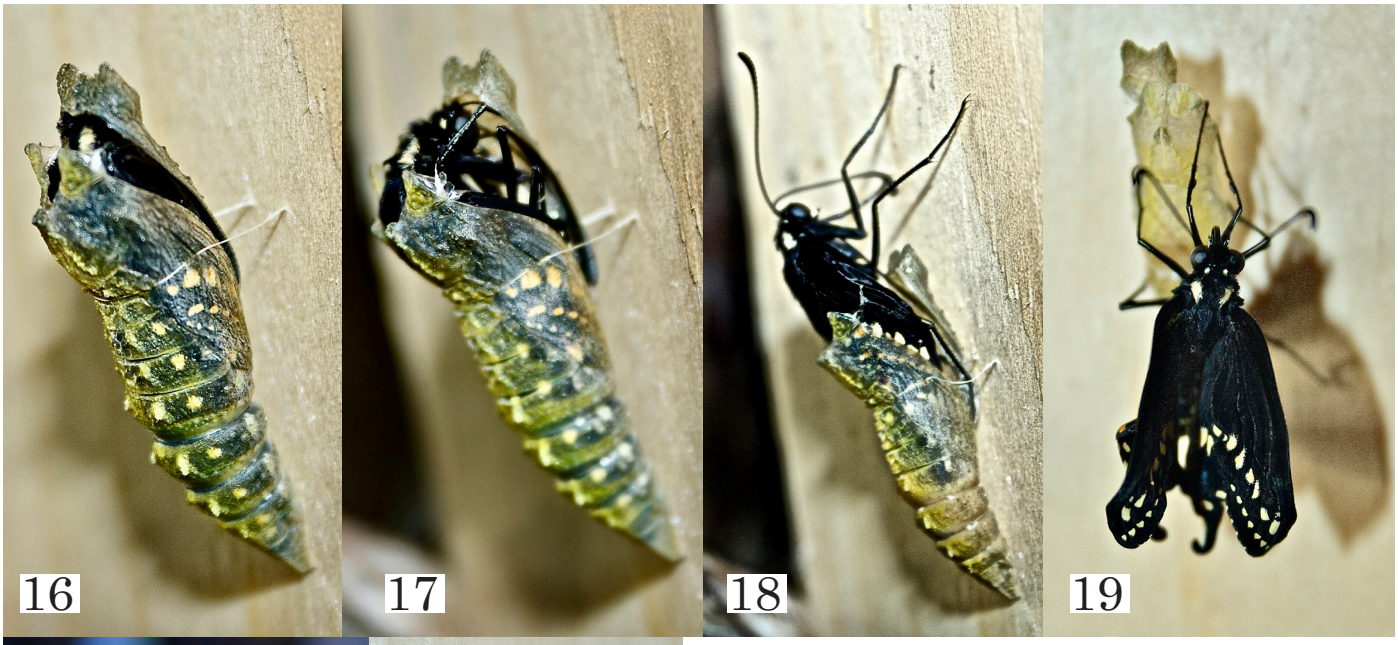


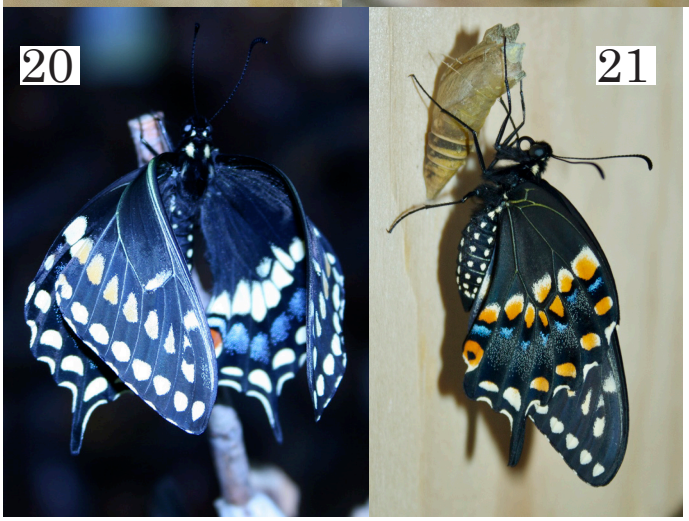
Figs. 8 - 15. 8) Black larva set to molt. 9) *P. polyxenes* larva breaking out of 2nd thoracic segment. 10) New white striped "tapes" assist chrysalis molt. 11) More new soft chrysalis exoskeleton extracted. 12) Shedding skin past the anchor silk girdle. 13) Molting chrysalis ready to extract "peg leg cremaster". 14) Molted chrysalis has extracted cremaster that jabbed the silk button. 15) Black Swallowtail brown phase chrysalis camouflaged on bark.

mother swallowtail flew to lay her eggs in other acres, but when the nursery was cut for recreation early instars were likely lost. This last summer 2023 showed very few blacks were on record, despite the grandeur of Queen Anne's Lace, so treasure the extensive ritualized courtship when you find it. (figs. 22 - 26).

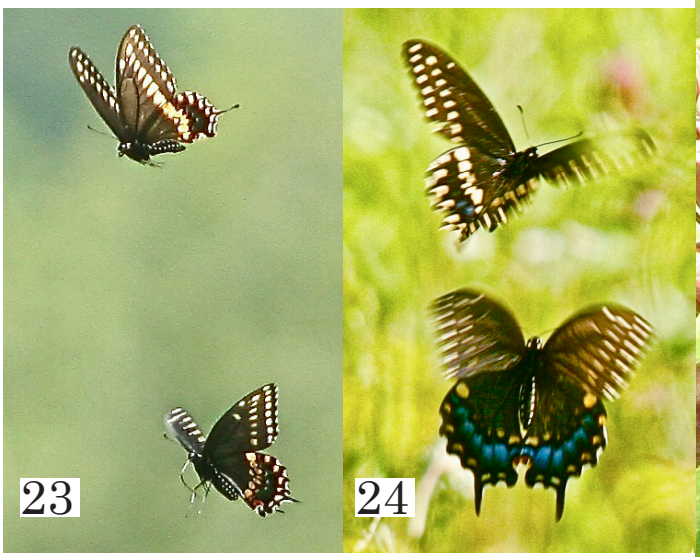
Luckily our touring shuttle bus chartered by Expedition Travel out of Gainesville Florida stopped at Teotihuacan Mexico. Our group leader, Tom Emmel PhD, had just shown us the Monarchs overwintering at El Rosario & Chinchua. The Monarca consortium in Mexico had built a magnificent staircase to escort tourists up to behold the migratory monarchs draping the Oyamel firs, and they are restoring the crowning woodlands with hundreds of young fir saplings planted in an effort of reforestation. Riding in a caravan of horses to high elevations can ease the climb to behold the roosting denizens.

Tom had a special surprise for us at another location. We visited Teotihuacan and its famous pyramids. As we climbed the steep staircase on the pyramid of the Sun, we found Black Swallowtails

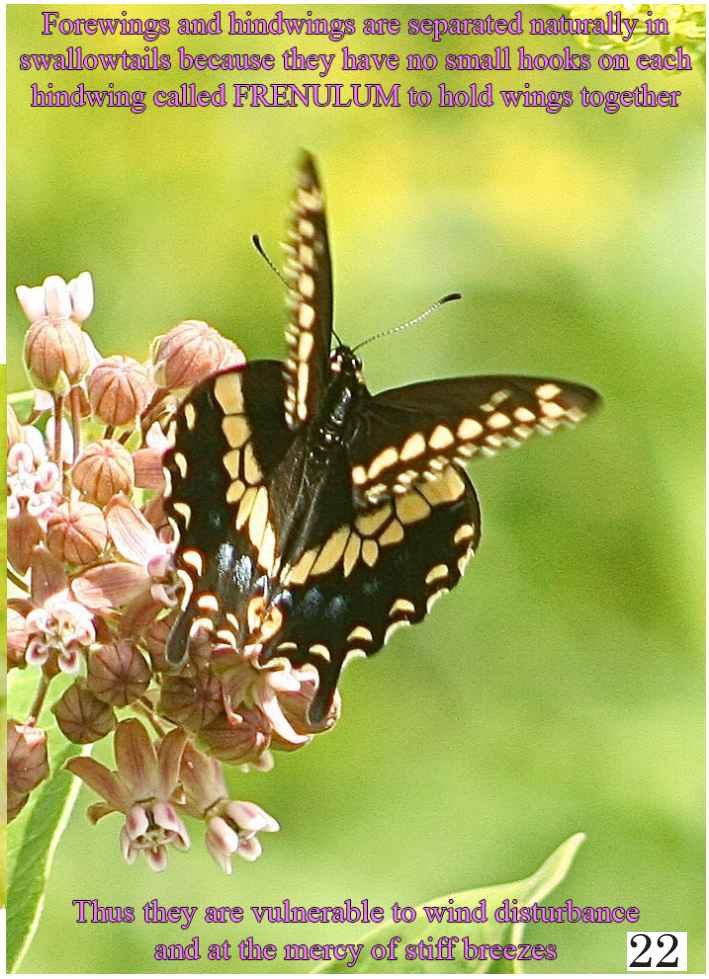


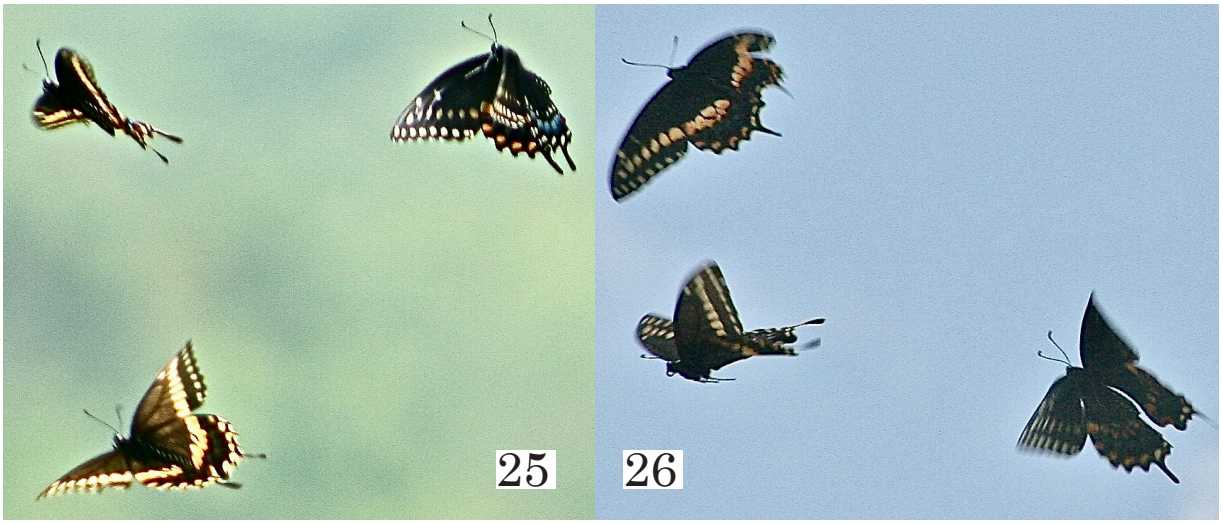


Figs. 16 - 21. 16 & 17) Black Swallowtail emerging behind head of chrysalis. 18) Emerging Black new antennae & legs getting foothold. 19) Shrivelled wings & small swallowtails unfurl. 20) Black Swallotail limp wings reaching full size. 21) Black female wings fully spread taught.



Figs. 22 - 24. 22) Male Black Swallowtail showing no frenulum. 23 & 24) Male & females Blacks swirling in courtship.





Figs. 25-26. 26) Second male black joins in courtship spiralling flight. 27) Two males & one female in aerial courtship swirl upwards to 100 feet.

"hilltopping" and roosting on jutting stones to court a passing female (figs. 27 - 28). Yes males would flutter all the way up, or roost part way on prominent rocks restored by recent archaeologists. I did not witness a couple in the making, but all signs signaled a positive promotion for gene pooling. On the topmost plateau Dr. Emmel & students were videoing courtship, and the blacks would exhort - roost and flutter. Other suitors included longwing skippers. Pre-columbian customs featured priestly rites given to insure fertility, and the *P. polyxenes* exemplified an ecliptic coda to confirm the blessed folklore. Although the horrific tales of human sacrifice are gruesome, the butterflies still utilize the man made habitat for their aerial courtship. Explorers can climb to the top of Teotihuacan to see the nimble tracing of the ritualized courtship. *Papilio polyxenes* has another place for reproduction thanks to the reconstructed host site of Teotihuacan.

Figs. 27 - 28) Papilio polyxenes will engage in aerial courtship, "hill topping" on jutting rocky slopes of Pyramid of the Sun.

References for Solis and Thomas, distribution and new host plant for *Udea profundalis*, continued

Continued from p. 127

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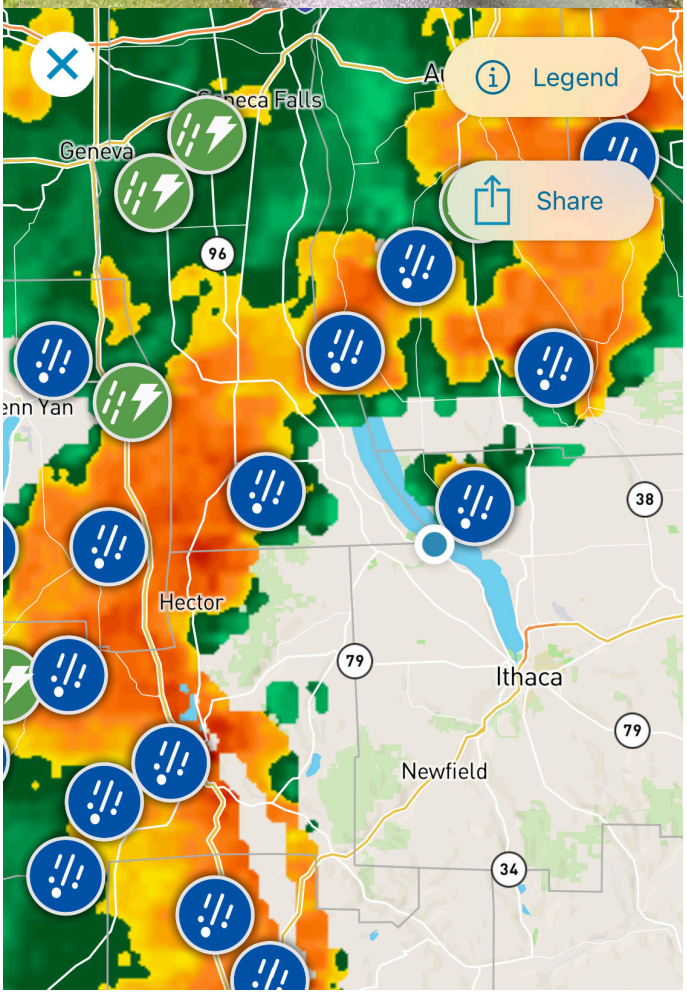
The 72nd annual Lep Soc meeting student award winners and photos from the meeting

This year's Lep Soc meeting was at Cornell University in Ithaca, NY. The presentations were July 14-16, 2024, with a total of 34 talks. There were a total of seven student talks, and a poster session with four presenting students. Kyhl Austin won the first place presentation award for his talk "Towards a conservation assessment of the endemic Hawaiian Lepidoptera". Second place went to Andrea C. Jiménez Bolivar (co-authored with Ivonne J. Garzón Orduña) for her presentation "Barcode taxonomy in *Arsenura* Duncan, 1841 (Saturniidae: Arsenurinae): does it do what it is supposed to do?". First place in the poster presentations went to Luc Micheels for his poster "Not my type: *Euclea cippus* and nearly 200 years of taxonomic splitting". Second place went to Seyde Delgado for her poster "Investigating the role of Schnurri in wing color pattern development." Congratulations to the winners! To see the entire program, go to the Lep Soc website, as it is already available there.

Next year's meeting will be in Sierra Vista, Arizona, at the Sierra Suites Boutique Hotel, likely from the dates of July 30-Aug. 3, 2025.

Enjoy the photos from the meeting. There will likely be more images from the meeting in the Winter issue of the News, so stay tuned!

The four student award winners. Top left: Kyhl Austin, first place (presentation); bottom left: Andrea C. Jiménez Bolivar (presentation); top right: Luc Micheels (poster); bottom right: Seyde Delgado (poster). Ivonne Garzón, Lep Soc president, congratulates them all. All images this page by James K. Adams.



Top (left to right): Tony McBride, Michael Collins, Eric LoPresti. Middle (left to right): Eric LoPresti Tanner Matson, James Adams, Hugh McGuinness. Bottom: Jason Dombroskie, enthused as always about a drawer of Lepidoptera. Upper right: John and Poody Brown and Bernard Landry escaping the deluge. Right: the radar of the storm front approaching the BBQ (blue dot, encircled in white). All images this page by Chris Grinter.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Intra-specific Diversity

Metamorphosis

James Philip Fitter

James Philip Fitter June 17, 1945 – May 13, 2021 Lt. Col. James P. Fitter, U.S. Army (Retired) passed away peacefully on May 13, 2021. He was born June 17, 1945 in Kirbyville, Texas to Philip A. Fitter (USAF) and Kathleen McKinnon Fitter. He traveled widely as an Air Force brat, living in Alaska, England and France, before graduating from high school in Westford, Massachusetts in 1963. He attended Oklahoma State University as an Army ROTC student, and entered the Army as an infantry officer upon graduation. After college, James attended Airborne School at Fort Campbell, Ky. and graduated from Ranger School at Fort Benning, Ga. He served a tour of duty in Vietnam with the 101st Airborne Division, leading Long-Range Reconnaissance Patrol teams. Following the war, he was an instructor at the Ranger School in Eglin AFB, Fla., once entertaining his students with an unintentional demonstration of the wrong way to pick up a venomous coral snake. During that same incident, he entertained doctors with the discovery that he was allergic to snake antivenom. James enjoyed a distinguished Army career. He completed the Advanced Infantry Course in the top ten of his class at Fort Benning. He commanded C Company, 2/7 CAV; Headquarters Company, 1st Cavalry Division; and A Company, 75th Rangers at Fort Hood, Texas. James returned to Oklahoma State University to teach ROTC, where the highlight for his students was learning to rappel off the roof of Thatcher Hall. He graduated near the top of his class from the Command and General Staff College at Fort Leavenworth, Kan. and served as Director of Training for the 193rd Infantry Brigade at Fort Clayton, Panama. He was the Deputy Chief of Staff in the Army Operations Center at the Pentagon and focused on Latin America and the Caribbean. In his final duty station, he served as chief of staff for Joint Task Force Bravo at Soto Cano Air Base, Honduras. James received numerous decorations during his career, including the Bronze Star, Meritorious Service Medal with three oak leaf clusters, Army Commendation Medal with two oak leaf clusters, Army Achievement Medal, National Defense Service Medal, Air Medal, Vietnam Service Medal, Vietnam Campaign Medal, Republic of Vietnam Gallantry Cross Unit Citation, Army Service Ribbon, Overseas Service Ribbon, Combat Infantryman Badge, Senior Parachutist Badge, Ranger Tab, Defense Meritorious Service Medal, and the Legion Of Merit. Not many Army Rangers are also entomologists, but James was fascinated with bugs from an early age, as evidenced by his childhood hobby of shooting bees with his BB gun. His siblings say you could always tell when he missed one, because the gun would go flying in one direction while James ran off in the other. He parlayed this interest into Bachelor's and Master's degrees in entomology with a specialty in butterflies and moths. He frequently took bug-catching expeditions and amassed a beautiful collection of specimens he stored in a hand-built display cabinet. A brain injury sustained at age 43 cut short his military career and his outdoor wanderings, but he maintained his sense of humor and his keen interest in science, nature, and history. He read countless books. He enjoyed being a father and grandfather. His pride over his children's and grandsons' accomplishments was matched only by his glee over their shenanigans. He always particularly enjoyed shenanigans and it was easy to make him laugh. He is survived by his wife of 53 years, Virginia Fitter, of Fairfax, Va.; his son John Fitter, of Bethesda, Md.; his daughter Susan Harris, son-in-law Trey Harris, and grandsons Hunter and Barrett Harris, of Alexandria, Va.; his sister Mary Cox, of Texas; and his brother John Fitter, of New Mexico. A private funeral service will be held at Arlington National Cemetery. In lieu of flowers, the family invites donations to the Army Emergency Relief fund, which supports Army families in need. See https://www.armyemergencyrelief.org/donate/

To plant a beautiful memorial tree in memory of James, please visit our Tree Store at **https://tree.tributestore.com/memorial-tree?oId=22027150&source=ta1&taph=1&bn=Tribute%20Archive%20-%20One%20Funnel&&tn=OF_ObitMVP_V3&otv=One-Funnel.**

The Fitter family

Opposite page, left column. Top: folks at the BBQ (left to right) Dave Wagner, Paul Goldstein, Chris Grinter, Allison Fletcher, Ivonne Garzón, and Kevin Keegan. Middle: Richard Brown and Alma Solis. Bottom: Ernest Williams. Right column. Top: Hugh McGuinness, Jean-François, Marie-Thérèse, and Marie Landry. Second down: Christina Baer, Chris Grinter and Laura Gaudette. Third down: Felix Sperling, Chris Grinter, Paul Goldstein and Andrea C. Jiménez Bolivar. Bottom: Bob Dirig and Daniel Rubinoff. Above: Rig Peigler and Chris Schmidt. Top two images left column and top three images right column by Ivonne Garzón. Bottom two images by Mike Collins. Image above by Ric Peigler.

Membership

The Lepidopterists' Society is open to membership for 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; ***kerichers74@gmail.com***

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
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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).

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

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Requests for missed or defective issues should be directed to Chris Grinter. Please be certain that you've really missed an issue by waiting for a subsequent issue to arrive.

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

Submissions of potential new Memoirs should be sent to:

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Journal of The Lepidopterists' Society

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Send book reviews or new book release announcments to either of the following (do NOT send new books; authors will be put in contact with reviewers):

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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. Graphics/figures should be at least 1200 x 1500 pixels/inch^2 for interior use, 1800 x 2100 for covers.

2. Article (and graphics) on disk 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 word processing software and numerous photo/graphics software. Media will be returned on request.

3. Color and B+W graphics; should be high quality images suitable for scanning. Original artwork/maps should be line drawings in pen and ink or good, clean photocopies. Color originals are preferred.

4. Typed copy, double-spaced suitable for scanning and optical character recognition.

Submission Deadlines

Material for upcoming volumes must reach the Editor by the dates below:

Issue			Date Due
66	4	Winter	November 15, 2024
67	1	Spring	February 15, 2025
	2	Summer	May 12, 2025
	3	Fall	August 15, 2025

Be aware that issues may ALREADY BE FULL by the deadlines, and so articles received close to a deadline may have to go into a future issue.

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.

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