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Front Cover:

Top: *Helicopis gnidus*, Playa Rica, Putamayo Province, Columbia, Feb. 4-5, 2025. Bottom: *Helicopis cupido*, Napo Wildlife Center, Yasuni National Park, Orellana Province, Ecuador, April 16, 2011. Images by Bill Berthet. See related article pg. 90.

The female of *Eupithecia vargoi* Ferris (Geometridae) confirmed by barcoding

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Ferris (2022, text & plate 235) described *Eupithecia vargoi* based on three male specimens collected by Jim Vargo in Grant Co., New Mexico. In the same publication, Ferris also described *E. longispinata* (text & Plate 236) based on eight male specimens from Otero Co., New Mexico. By locality association, a female specimen collected by Ferris (Plate 237) was tentatively assigned to *longispinata*. Additional collecting in 2023 by Vargo and Steve Johnson in Otero Co. produced a large series of both sexes of *E. longispinata*. It was then apparent that the moth originally thought to be the female of *longispinata* was another species, which ultimately turned out to be a female of *E. vargoi*. The male and female (adults and genitalia) of *E. longispinata* were subsequently illustrated by Ferris (2023). Also in 2023 collecting by Vargo and Johnson in Otero Co., NM produced a series of *E. vargoi*. Johnson sent specimens to Russo for preparation, including females that looked in habitus similar to those of *E. persimiulata* McDunnough, but had slightly different genitalia. She in turn sent legs of 1 male and 2 females to Hugh McGuinness and John Brown at the Smithsonian Institution, Washington, DC (USNM). The barcoding was done by Alicia Timm at Colorado State University, Fort Collins, CO, confirming the specimens to be conspecific.

The accompanying figure illustrates a male and three females of *E. vargoi* with their associated genitalia. A peculiarity of the female genitalia is a thin gelatinous membrane that surrounds a portion of the bursa copulatrix. The collection data for the barcoded specimens are: New Mexico, Otero Co., 7.5 miles west of Weed [Sacramento Mts.]; 32.8075,–105.6488; 15 August 2023, leg. Steve Johnson. *E. longispinata* and *vargoi* are now known from both Grant and Otero counties in New Mexico.

Eupithecia longispinata Ferris (Geometridae). News of the Lepidopterists' Society, 65(4): 183.

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_____, 2023. The correct male–female association for

The natural history, sericultural history, and future prospects of *Gonometa rufobrunnea* (Lasiocampidae) in Botswana, and notes on the cochineal scale insect *Dactylopius coccus* (Hemiptera: Dactylopiidae)

Die Naturkunde, Geschichte der Seidenraupenzucht und zukünftige Aussichten der Nutzung von *Gonometa rufobrunnea* (Lasiocampidae) in Botswana, und Anmerkungen zur Koschenilleschildlaus *Dactylopius coccus* (Hemiptera: Dactylopiidae)

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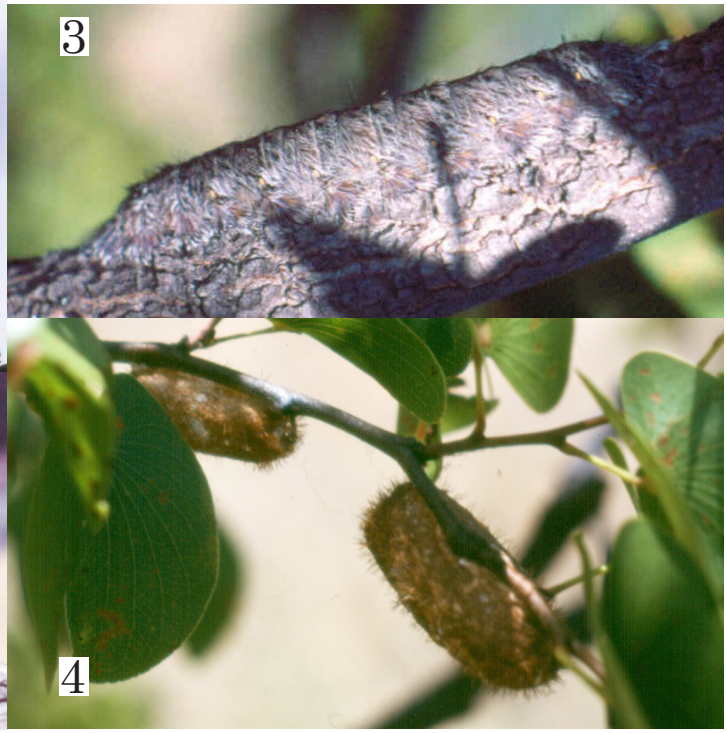
ABSTRACT *Gonometa rufobrunnea* is a large reddish-brown moth found in the mopane woodlands of southern Africa, and its larvae feed only on leaves of the mopane tree. The large conspicuous cocoons have been collected and processed for their silk in a few historical ventures, the main one being in the late 1980s and early 1990s in Francistown, Botswana, by a company named Shashe Silk. Attempts to mass-rear the caterpillars were not successful, but the handspun yarns of this silk yield very fine scarves, throws, caps, and other garments by knitting, crocheting, or weaving. This silk can be dyed with vegetable dyes and cochineal, the latter resulting in strikingly beautiful pieces. We review the published life-history of this species, the attempts to produce and market its silk, and we show several items in the natural beige color or dyed with cochineal, some of which were deposited into museum collections by us. We briefly cover the taxonomy and uses of the cochineal scale insects and describe the dyeing process, and we identified the exact species and source of the cochineal that was used in these textiles. Finally, we discuss the lessons learned from the attempts thus far to harvest and market this wild silk and offer suggestions for others who may wish to exploit this abundant and potentially valuable natural resource in a sustainable way, whether as a major business venture or small, localized projects aimed at poverty alleviation and fair trade.

ZUSAMMENFASSUNG *Gonometa rufobrunnea* ist eine große, rötlich-braune Motte, die im südlichen Afrika in Mopane Waldgebieten vorkommt. Die Larven ernähren sich ausschließlich von den Blättern des Mopane Baumes. Versuche, die Raupen in großem Stil zu züchten, waren nicht erfolgreich. Historisch wurden die großen, auffälligen Kokons in kleinen Mengen gesammelt und in ein paar wenigen Unternehmen auch zur Gewinnung von Seidenfasern bearbeitet. Das größte Unternehmen war in den späten Jahren von 1980 bis frühen 1990 in Francistown, Botswana die Fabrik Shashe Silk. Das handgesponnene Garn dieser Seide ergibt, gestrickt, gehäkelt oder gewebt, sehr edle Schals, Schultertücher, leichte Decken, Mützen, und andere Bekleidung. Diese Seide kann sehr gut mit Pflanzenfarben und Koschenille gefärbt werden. Die Koschenille Färbung ergibt intensive Farben und eindrucksvoll schöne Ergebnisse. Wir besprechen den Lebenszyklus dieser Art, die Versuche, Seide zu produzieren und zu vermarkten. Wir zeigen mehrere Stücke in der natürlichen beigen Farbe und andere mit Koschenille gefärbt, von denen wir einige in Museumskollektionen hinterlegt haben. Wir erfassen kurz die Taxonomie und den Gebrauch der Koschenilleschildläuse und beschreiben den Färbeprozess. Wir identifizierten die genaue Spezies und Herkunft der Koschenille, die in diesen Textilien benutzt wurde. Zum Schluss diskutieren wir die Erkenntnisse aus den bisherigen Versuchen, diese Wildseide abzusammeln und zu vermarkten und bieten Vorschläge für andere, die den Wunsch haben, diese ergiebige und potentiell wertvolle natürliche Ressource auszuschöpfen, entweder als größeres Geschäftsmodell oder als kleines lokales Projekt, mit der Ausrichtung auf Armutsbekämpfung und Fair Trade.

Introduction

Gonometa rufobrunnea Aurivillius (Lasiocampidae) (Figs. 1-4) is a prime example of a species in which the fields of entomology (field ecology) and fiber arts (spinning, weaving, etc.) intersect. Here we provide a literature review and summary of what is known about its taxonomy and natural history and document much unpublished information on the sericultural history of this silkmoth. Peigler (1993, 2020) has a long-term interest in wild silks. Pahlen lived in Botswana for 16 years (1987-2003) and worked with the silk of this moth for over 30 years by spinning yarn,

Fig.1. Pinned pair of *Gonometa rufobrunnea*. Francistown, Botswana, xi. 1991 (Denver Museum of Nature & Science). Photo by Rick Wicker. Fig. 2. Living female of *G. rufobrunnea* Francistown, xi. 1991. Photo by R. Hartland-Rowe. Fig. 3. Mature larva of *G. rufobrunnea*, showing how they rest pressed against stems of mopane during daytime. Photo by Ruan Veldtman. Fig. 4. Cocoons of *G. rufobrunnea* on mopane stems showing spines that larvae incorporate into their cocoons during construction. Photo by Ruan Veldtman.



weaving textiles, sewing, knitting, and crocheting garments, and using natural dyes to color the silk. We were fortunate to communicate with Ian S. C. Parker, who lived in Kenya running a wildlife management consultancy across Africa and was a founding member Shashe Silk (Pty) Ltd in Botswana but now lives in Australia. He generously provided much useful information, some of which is recorded here.

The moth was figured by Pinhey (1975: 126, pl. 26, fig, 537) under the incorrect name *Gonometa fulvida*, a name now known to refer to another southern African lasiocampid correctly called *Eutricha fulvida* Distant. Vernacular names for *G. rufobrunnea* include copper chopper (Pinhey 1975) and mopane moth (Zethner 2008: 49), as the larvae feed on mopane (Fig. 5).

There are at least 15 species in the genus *Gonometa*, all in sub-Saharan Africa (Aurivillius 1927a, b: 256-259, pls. 36-37; Collier 1936: 405-408). The type-species is *G. postica* Walker, moths of which are the same size as those of *G. rufobrunnea*. However, the moths of some others are huge, such as *G. nysa* Druce and *G. titan* Holland (Ihle 2022), and their larvae are among the largest caterpillars in Africa. The genus ranges as far north as Guinea in West Africa and Kenya in East Africa (Joannou and Kühne 2008: 133). Only *G. postica* and *G. rufobrunnea* have been exploited for silk, perhaps because these two arid-adapted species produce hardened, dense cocoons containing more silk than cocoons of those in mesic zones of tropical Africa.

The larvae of *Gonometa* have stinging spines that are detached by the caterpillar as it spins its cocoon leaving

Fig. 5. Mopane (*Colophospermum mopane*) grown in San Antonio, Texas, from seeds.

many spines projecting outward, which probably deter mammalian predators (Akai et al. 1997). The females of *Gonometa* are well camouflaged and resemble dead leaves. The much smaller males of most species are diurnal, flying rapidly and mimicking wasps or bees. Since they do not come to lights like the females, most males in collections were reared from cocoons. However, judging from the figure of the male of *G. regis* Aurivillius shown by Joannou and Kühne (2008: fig. 1206), we believe that males of some species are nocturnal because they are not gracile mimics of wasps. Working in Kenya, Okelo (1972) published a detailed description of the early stages and biology of *Gonometa podocarpi* Aurivillius, whose larvae are pests of introduced conifers (*Pinus, Cupressus, Juniperus*) and feed on other trees (*Eucalyptus, Podocarpus, Vachellia, Acacia*). Okelo observed over a period of years that matings of the moths in cages never occurred but were easy to obtain in an open-air insectary. *Gonometa podocarpi* is a denizen of mesic highlands in Kenya, Uganda, and Tanzania. Two recent papers present detailed descriptions and many color photos of the life stages of *G. podocarpi* (Ihle and Naumann 2025) and *G. titan* (Ihle 2022), but these studies are based on rearings in captivity in Germany instead of observations in the field in Africa.

Archaeological evidence cited by Peigler (2022) revealed that cocoons of *Gonometa rufobrunnea* and *G. postica* have been used for thousands of years by the San (Bushmen; called Basarwa in Botswana) in southern Africa to make ankle rattles worn by men during their trance dances. Tswana peoples today also commonly use these cocoons for ankle rattles (Fig. 6) in ceremonial dances by women and men (Clary 2009: 27; Peigler 2022). The empty cocoons contain gravel and are strung onto cords or long strips of buckskin. When ends of cocoons are cut off to extract the pupae, they are resealed with plant resin (Parker, pers. comm.). These are the only two species of *Gonometa* for which cocoons are used to make dance rattles, as far as we know. The cocoons of these two arid-adapted species are well-suited to make such rattles, due to their hard and strong texture. This is because the larva defecates calcium crystals to harden the outer cocoon before spinning the inner layers (Akai and Nagashima 2003). These white crystals are easily seen on the cocoon surfaces, even in old rattles. In 2000, Botswana issued a set of postage stamps depicting moths, including one of *G. rufobrunnea.*

Fig. 6. Ankle rattles for ceremonial dances made by Tswana people in Botswana in 2022. The pair on the left is composed of whole male cocoons, the pair on the right of cut female cocoons.

There are numerous reports of cattle dying after ingesting cocoons of *Gonometa rufobrunnea* or *G. postica* in Namibia, Botswana, and South Africa. These cocoons can cause impaction of the rumen. These cases are probably more common where the land is overgrazed, leading cattle to browse trees and shrubs, many of which have cocoons attached (Edwards 1935, Babayani and Nyange 2019; Staude et al. 2023: 254). Therefore, when cocoons are collected in large numbers to use for sericulture, this activity is viewed favorably by cattle farmers.

Natural history of *Gonometa rufobrunnea*

The moths of *G. rufobrunnea* emerge in September and October and, as with all Lasiocampidae, do not feed and live only a few days. Females lay about 200 white spherical eggs, usually in groups of 5-6 on grass stems below the hostplant. The eggs hatch in 10 days. The caterpillars feed exclusively on leaves of the mopane tree (*Colophospermum mopane*, Fabaceae), whereas those of *G. postica* feed on many kinds of woody Fabaceae, including several species of *Vachellia* and *Senegalia*, all formerly classified in the genus *Acacia* (Von Breitenbach 1987; Van Wyk 1992), *Julbernardia globiflora*, and two species of *Brachystegia.* Hartland-Rowe (1992b) tested larvae of *G. rufobrunnea* on several of these Fabaceae, but only mopane was accepted, so his observations suggest that the insect is strictly monophagous. Interestingly, he also observed that larvae of *G. postica* would not accept mopane, and although Peigler (1993) erroneously reported that they will feed on mopane, Ruan Veldtman (personal communication Nov. 2024) confirmed that they do not. Hartland-Rowe discovered that it is difficult to mass rear the larvae of *G. rufobrunnea* on mopane trees, apparently because the plants produce allelochemicals when defoliators become too numerous.

Hatching caterpillars climb up into the mopane trees from the ovipositional sites at ground level. The young larvae are gregarious, congregating on tips of dead twigs during day, and feeding on leaves during night. In the early stages they are heavily preyed upon by assassin bugs (Hemiptera: Reduviidae). Older caterpillars are well-camouflaged by resting on stems during the day (Fig. 3), and they have urticating spines, which detach in human skin and cause intense irritation. After six weeks they reach 80-90 mm

in length and seek sites to form their cocoons. Cocoons are usually spun on a thorny twig (Fig. 4) and some larvae move up to 30 m before spinning. Cocoon formation begins in the evening and by morning the cocoon is already hard. The main flight is in September and October, but about 20% of the cocoons yield adults in January or February for a partial second generation. Diapause is terminated when nighttime temperatures exceed 15° Celsius, but Parker found that other parameters must be involved in termination of diapause. Several parasitoids attacking the eggs, larvae, and pupae of *Gonometa rufobrunnea* were found and cited by Hartland-Rowe (1992a, b), but Veldtman (2004: Chapter 2, Table 1) collected many more for both species of *Gonometa* and discussed the host-parasitoid interactions of several of them. The parasitoids attacking larvae included 7 species of Tachinidae (Diptera), 1 Braconidae, 1 Ichneumonidae, 8 Chalcididae, and 1 Eurytomidae (all Hymenoptera). Egg parasitoids included 8 species in Eulophidae and Eupelmidae (both Hymenoptera).

The population dynamics of *G. rufobrunnea* have a direct effect on its sericultural potential, because the species is only useful when population levels in the field are high enough to allow a sufficient number of cocoons to be collected. The species is most abundant during drought years, perhaps because drier conditions are not suitable for the many parasitoids and some invertebrate predators (Veldtman 2004). Populations of the insect were very high in 1986 and 1987, but higher than usual rainfall at the end of 1987 led to a sharp decline in the populations. Moreover, a climatic event in 1990 caused the levels to crash in Botswana, because low rainfall in October and November of that year meant that mopane trees did not leaf out until early December. However, the moths emerged and oviposited weeks earlier, because their diapause was not terminated by rainfall but by higher nighttime temperatures, as mentioned above, so the hatching caterpillars starved (Hartland-Rowe 1992 a,b). Interestingly, populations of *Gonimbrasia belina* (Westwood) (Saturniidae: Bunaeinae) are denser during years of higher rainfall. These "mopane worms" are an important source of human food and feed on the same hostplant as *G. rufobrunnea*.

As suggested by Parker (pers. comm.), we believe that population explosions of *G. rufobrunnea* are more likely in the more arid areas where the mopane trees are scrub (3-4 m tall), as opposed to farther east where mopane trees grow much taller (18-21 m tall) (Van Wyk 1992: 83). This may explain why the range of the moth is restricted to the western range of the hostplant (Veldtman et al. 2002: Fig. 1, map), providing another critical clue about the ecological requirements of the moth.

Hartland-Rowe (1992b) made hybrid crosses between *Gonometa postica* and *G. rufobrunnea*, but the hybrid larvae were weak, only male pupae were obtained (half the weight of non-hybrids), cocoons were thin and papery in texture, and no adults emerged.

Sericultural history of *Gonometa*

James B. Hellier arrived from England in 1864 to the Eastern Cape Province where he worked in agricultural research, including rearing *Bombyx mori* (Linnaeus) and some native silkworms. He collected cocoons of *Gonometa postica* in Uitenhage (now Kariega) and described the physical characteristics of the silk fibers. He immersed the cocoons in hot lye so was able to produce yarn and cloth (Rondot 1887: 494-495, repeated by André 1908: 239). This is the earliest specific report we know for the exploitation of *Gonometa* for its silk. However, in their treatment of *G. postica*, Staude et al. (2023: 254) wrote "Cocoons produce high-quality silk harvested by local peoples for centuries."

In the late 1800s and early 1900s there was a team working at a sericulture institute in Lyon, France, called Laboratoire d'Études de la Soie de la Condition Publique des Soies. Between 1897 and 1910 they published a series attempting to treat all Lepidoptera plus the giant spider *Trichonephila madagascariensis* (Vinson) (formerly in the genus *Nephila*) considered to have potential for commercial silk exploitation, for which we cite the fascicle covering the Lasiocampidae (Conte 1906: 55-60 [*Gonometa*]). Those French workers predictably focused their field studies on wild silkmoths of West Africa, Madagascar, and Southeast Asia. The archives, pinned moths, empty cocoons, and samples of silk showing the process from cocoons to cloth accumulated in the above institute are now preserved in the Musée des Confluences in Lyon, of which Clary (2009) illustrated many historical examples. Peigler studied that collection in 2003 but did not find any silk samples of *Gonometa*.

The Kenya Ministry of Agriculture had a small silk research unit working with *Bombyx mori*. They reported to Parker that in the early 20th century there were repeated attempts by Indian entrepreneurs to identify sources of wild silk in the Fort Hall District (now Muranga County). There were some minor successes but they were never sustained (Parker, personal communication).

In 1999 Pahlen met informally with people from development agencies from Windhoek, Namibia, who were interested in starting sericulture projects using *G. postica,* and she provided technical advice on hand-spinning and hand weaving products. Soon after, scarves, shawls, cushion covers, and other handicrafts composed of the silk of *Gonometa postica* have been occasionally available in the last 20 years in local shops and from internet sources in Leonardville, Namibia, and across South Africa, and Peigler bought many such pieces and sent them to entomology programs at universities in the United States, to ensure that samples of that type of wild silk would be preserved (Peigler 2020). Cocoons of *G. postica* have also been mass reared and processed in Kenya, where the finished products were called savannah silk (Zethner et al., 2008: 45-46). Akai and Nagashima (2003) provided a photograph

of a hank of reeled (not spun) silk of *G. postica* that they produced experimentally in Japan.

The size of cocoons of *Gonometa* differs due to species, sex, hostplants, localities, and generations, and these data are critical when attempting to estimate silk yields as part of a sustainable utilization program for harvesting the cocoons (Veldtman et al., 2002).

The mopane tree was introduced to western Rajasthan where extensive plantings of this tree provide sand dune stabilization. Subbulakshmi et al. (2017) discussed the potential of introducing *Gonometa rufobrunnea* to this area, because wild silk culture provides an important source of economic opportunity for rural people in India (Selk 2022). However, we do not believe that the moth was introduced to India.

Parker (personal communication) obtained and degummed cocoons of *Gonometa podocarpi* in Kenya for experimental trials and found that the silk was an attractive silver color, but since cocoons of that species contain much less silk than those of *G. rufobrunnea* and *G. postica* (as stated above), he saw no immediate commercial potential. However, these early trials set the scene for establishment of Shashe Silk (Fig. 7) and spinning the silk by hand (Fig. 8) and machinery, all detailed below.

Sericultural history of *Gonometa rufobrunnea*

Although scarves and other handicrafts composed of silk of *G. postica* have been marketed as indicated above, samples of processed silk and finished products composed of the silk of *Gonometa rufobrunnea* are extremely rare in institutional and private textile collections. A large throw dyed with cochineal (Figs. 9-10) and woven by Pahlen is preserved in the Supa Ngwao Museum in Francistown, Botswana, and skeins of handspun yarn were sold at the museum. Outside of Botswana, as far as we know, a throw woven by Pahlen and sent to Peigler, then a curator of entomology at the Denver Museum of Nature & Science in 1995, plus a few scarves knitted by Pahlen or woven in

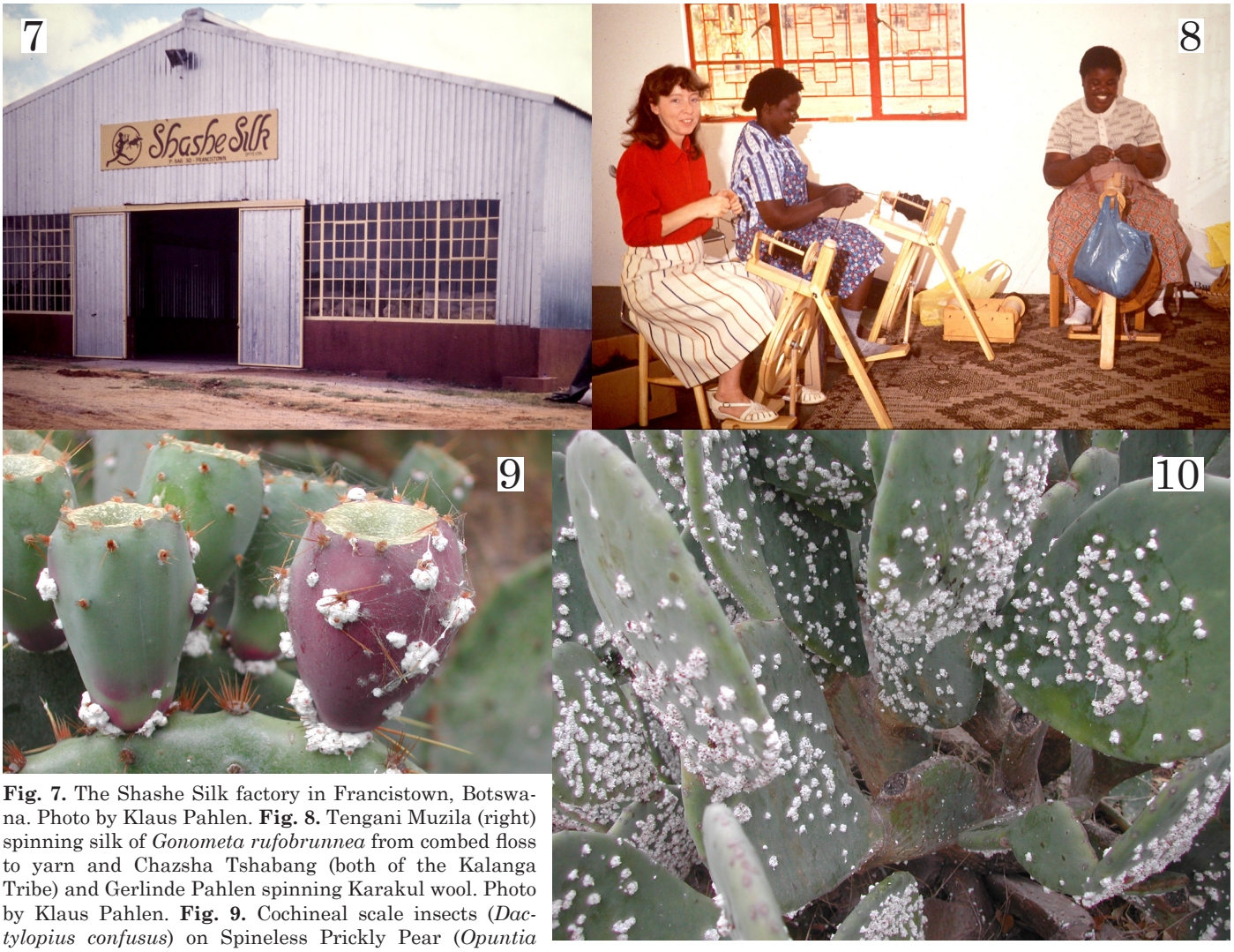


Fig. 7. The Shashe Silk factory in Francistown, Botswana. Photo by Klaus Pahlen. **Fig. 8.** Tengani Muzila (right) spinning silk of *Gonometa rufobrunnea* from combed floss to yarn and Chazsha Tshabang (both of the Kalanga Tribe) and Gerlinde Pahlen spinning Karakul wool. Photo by Klaus Pahlen. **Fig. 9.** Cochineal scale insects (*Dactylopius confusus*) on Spineless Prickly Pear (*Opuntia cacanapa* 'Ellisiana') in a garden in San Antonio. **Fig. 10.** Cochineal scale insects on Texas Prickly Pear (*Opuntia engelmannii*) in a field near San Antonio.

Italy in archive boxes deposited in the University of Florida by Parker (1999), remained the only pieces preserved in institutional collections for almost 30 years. Textile samples of *G. rufobrunnea* silk woven in Italy were also sent by Parker to Peigler in August 2024 (Fig. 11). However, after Pahlen and Peigler re-established contact in 2023, they agreed that more samples of this type of Kalahari wild silk (a term jointly coined by them in the 1990s) should be deposited in 2024 into more wild silk collections (Figs. 12-20). Additionally, a small, knitted scarf (not figured) of natural colored silk was sent to the Strickland Entomological Museum, Canada. All these items were woven, knitted, or crocheted by Pahlen (in Botswana or Germany), and she processed the natural dyes such as cochineal, mopane leaves, indigo, etc. Pahlen purchased a large lot of carded silk and handspun floss

Fig. 11. Experimental samples of *Gonometa rufobrunnea* silk cloth woven in Italy in 1980s. Background: orange fabric faded from exposure to sunlight and salt water for 10 years when fishing off the coast of Kenya. Fabric in natural color. Fabric dyed tomato red (original color of background). Natural colored yarn carded in Botswana and spun by machinery used to spin acrylic yarn for knitting. The red and orange samples show that this wild silk can be colored successfully with synthetic aniline dyes. All samples sent by Ian Parker to R. S. Peigler in August 2024. **Figs. 12—20.** Samples of finished products made of 100% silk of *Gonometa rufobrunnea*, all woven, knitted, or crocheted, and some dyed, by Gerlinde Pahlen. **Fig. 12.** Knitted cap and matching scarf of natural colored silk made in 2018 in Essen, Germany. The knit pattern is squares. Scarf is 12 cm × 180 cm (Collection of Richard S. Peigler). **Fig. 13.** Scarf crocheted of natural colored silk in 2024. The crochet pattern is called stars or blossom. 10 cm × 140 cm (Clemson University Arthropod Collection, South Carolina). **Fig. 14.** Scarf woven in November 2003 in Francistown, Botswana, of natural colored silk in rosepath (Rosengang) twill. 15 cm × 112 cm (Collection of Stefan Naumann, Berlin). **Fig. 15.** Throw woven in plaid twill pattern, different dyebaths of cochineal yielding different shades, made in Botswana in 1995. 110 cm × 125 cm (Denver Museum of Nature & Science, catalog no. AN-1996-32.17) Photo by Rick Wicker. **Fig. 16.** Scarf knitted in 2024 and dyed with cochineal. 12 cm × 135 cm (E. H. Strickland Entomological Museum, University of Alberta, Edmonton). **Fig. 17.** Mittens and matching cap knitted in 2019, from silk dyed in 1992 with yellow from mopane leaves with copper mordant, red from cochineal, green from yellow-wood + indigo. (Collection of Richard S. Peigler). **Fig. 18.** Throw woven on a countermarch loom in 2018 in rosepath (Rosengang) twill, dyed with cochineal. 70 cm × 82 cm (Musée des Confluences, Lyon). **Fig. 19.** Throw woven in plaid twill pattern, different dyebaths of cochineal yielding different shades, made in Botswana in 1995. 33 cm × 128 cm. Background is cloth of natural colored silk of *G. rufobrunnea* in a plain weave. (Collection of Gerlinde Pahlen, Arnsberg). **Fig. 20.** Throw handwoven in a twill pattern in 1992/1993 on a countermarch loom in Botswana, dyed with cochineal. 54 cm × 208 cm (Collection of Richard S. Peigler).

from Shashe Silk (see below) and after a handspinning project closed down, deposited most of that in the museum in Francistown, but she brought some of it back to Germany and now continues to use it to create finished articles.

The most important chapter in the history of sericulture of *G. rufobrunnea* follows. Between 1985 and 1995, a substantial investment into *Gonometa* sericulture centered around Shashe Silk (Pty) Ltd, a subsidiary of Botswana Game Industries (Pty) Ltd, of Francistown, Botswana. Despite great promise and progress, the company eventually failed. The reasons were summarized to us by Parker (personal communication), a remarkable story outlined in the three following paragraphs.

As cited above (Rondot 1887), cocoons of *Gonometa postica* were found to produce usable silk. This knowledge was rediscovered in 1985 when Geoff Bailey, a retired agricultural officer and amateur entomologist, accidentally dropped two *Gonometa postica* cocoons into a dilute solution of caustic soda (NaOH), revealing golden silk fiber. Peter Becker, the CEO of Botswana Game Industries, was interested in developing Bailey's finding, and had financial resources to do so. In these circumstances Botswana Game Industries formed Shashe Silk to develop *Gonometa* silk. The size, distribution and duration of the *Gonometa* outbreak in southern Botswana was never assessed, but eight tons of the cocoons were procured from it. The eruption in northeastern Botswana commenced in late 1985, peaked in 1986 and died back after rain in 1987. Learning *Gonometa* silk was of high quality, impressed by the quantity currently available and gambling that it could be marketed, Shashe Silk offered to buy all cocoons that the local people could collect at 1.00 pula (the Botswana currency) per 10-liter bucket. At the time, one pula was worth more than one German Mark. About 438 tons (430 from *G. rufobrunnea* and 8 from *G. postica*) of cocoons were thus purchased in 1986 and 1987, providing substantial money to the drought-afflicted local human population when it was desperately needed.

Technology to convert raw cocoons into silk fabrics was acquired in northern Italy using the systems applied in handling *Bombyx mori* cocoons. It involved five successive steps from degumming to producing a woven fabric. Each stage including the raw cocoons was saleable, and although weight loss occurred at each step, this was compensated for by a rise in value. The light golden *Gonometa* fibers matched those of *Bombyx mori* in quality and strength and readily took dyes. Subsequently, floss produced in Botswana was satisfactorily blended with wool, knitted into a batch of jerseys and sold for more than £100 each by Harrods in London. In Switzerland this silk was carded into high quality sliver and thread. Yet despite such progress, for multiple causes, Shashe Silk never made a profit, the principal being to allow a Swiss and a French company to buy Shashe Silk shares and conduct direct marketing of the silk. This influenced the company's decision to invest in new processing plant and equipment in anticipation of profits, rather than waiting until profits were in hand. When it was realized that the two European shareholders had been protecting their own interests in Switzerland and France and deliberately suppressing Shashe Silk sales, it was too late as the company was too far in debt for recovery. Further details regarding the commercial aspects are available in the Parker (1999) archive in the University of Florida.

In 1995 the South African petroleum company Engen Ltd contracted Parker to sell-off remaining silk stocks of Shashe Silk that included raw cocoons (many by then ten years old but still containing viable pupae), unopened silk waste, opened waste, and carded laps, proving the earlier point that there was demand for this silk at all stages. Though the raw cocoons had lost some quality because carpet beetles (Coleoptera: Dermestidae) had developed on the pupal debris inside the cocoons, they had been kept dry, so most still contained useful silk after ten years. The difference of 278 tons between the 438 tons of raw cocoons and the 160 tons held as stock was overwhelmingly accounted for by weight lost during processing and not by sales. Negotiated by a German firm, they were bought by a Chinese company at US $1,250 per ton and transported by rail to Durban in 16 wagons which Parker and we believe was Africa's largest ever silk export and China's largest silk import. It also illustrated the transition by China from being an exporter of raw material toward processing the final product.

In 1996, Peigler obtained a meter of fabric imported from China that was a plaid composed mainly of tussah silk from *Antheraea pernyi* (Guérin-Méneville), but with portions showing the distinctive grayish brown color of *Gonometa rufobrunnea* silk. This piece is preserved in the Anthropology Department at the Denver Museum of Nature & Science. Carolanne Nuttall (Sapulpa, Oklahoma) provided that cloth and correctly identified the African silk. A report to Oberprieler (1989) stated that "The President of Botswana already boasts a Botswana national flag in his country's own silk." and Peigler (1993) repeated this report. Parker recalls that the flag was made in Italy and was "ca. 4 feet × 8 feet" (1.2 m × 2.4 m) in dimensions. In August and September 2024, Pahlen sent several inquiries to officials and former friends in Botswana to determine the present location of the flag, without success.

Pahlen continued to assist the project by working with local Kalanga women in handspinning and weaving at a workshop established in Tutume, ca. 100 km from the Shashe Silk factory. Combed silk floss was brought from the factory and handspun into yarn. A second workshop, all under the umbrella of LUDABO (Lutheran Development Association Botswana, Kanye) was set up in Nswazwi with the support of the family of Rev. Holonga, 40 km from Tutume, where Pahlen visited fortnightly to teach, supervise, collect yarn, and deliver more floss. These workshops

provided significant employment for women, so that poverty alleviation was realized at this stage, as well as in cocoon collecting and employment at the factory. After the silk factory in Shashe closed, all these other activities also inevitably ended a few years later. The German Development Service provided funds to buy bales of combed floss, to secure the resource and continuation of the hand-spinning project until 1996. All the handspinning was done with spinning wheels; none with drop spindles (see Kolander 1985: 32-35).

Some comments above are based on letters to Peigler from Richard Hartland-Rowe from viii. 1991 to xi. 1993 and notes made by Pahlen who knew Becker and Hartland-Rowe personally. In a letter to Peigler dated 6 xi.1993, Hartland-Rowe wrote: "I have heard from Brussels that the EEC [European Economic Community] isn't at present planning to release the large funding they had set aside for *Gonometa* research in the southern African region, mainly because the planned participating nations have all refused to come up with any funding themselves (the EEC requires a minimal level of support for their programmes from the beneficiaries) but I'm hopeful that a suggested programme on a smaller scale may come into being in Botswana."

Cochineal scale insect

The cochineal scale insect (*Dactylopius coccus* Costa) (Hemiptera: Dactylopiidae) is originally native to the Andes in South America but was transported by humans to Mexico over 2200 years ago. There are several species in the genus *Dactylopius* native to North, Central, and South America (Van Steenderen 2020), but the species that Peigler observes occasionally infesting *Opuntia* (Cactaceae) in the wild (Everitt and Drawe 1993: 37) and cultivation is *Dactylopius confusus* (Cockerell) (Figs. 9-10), which was studied in Texas by Gilreath and Smith (1987).

These insects contain carminic acid (1,3,4,6-tetrahydroxy-9,10-anthraquinone) that they produce as a deterrent to predators. An aluminum salt of carminic acid is a pigment known as carmine, which has been recognized for centuries as a valuable natural red dye for textiles (Figs. 15-20), and it is still used to dye medicine, candy, beverages, and cosmetics (Eaton and Kaufman 2007: 104). Before the invention of aniline dyes in the mid-1800s, cochineal was a highly prized source of a colorfast (not fading in light nor with repeated laundering) pigment for textiles, so it became a product of high market value. Although used by indigenous Americans for millennia as paint and to dye their textiles (Will et al. 2020: 164-166), the market for Europe was first monopolized by Spain in the 1500s by growing huge quantities on the abundant native *Opuntia* in New Spain (now Mexico). Later, other European powers including Portugal, The Netherlands, France, and England introduced cochineal to Java, Haiti, South Africa, India, Australia, and elsewhere to profit from this trade. An excellent book by Amy Greenfield (2005) documents this history in detail. A lot of cochineal is grown commercially today in the Canary Islands and Peru.

The Mexican cactus *Opuntia ficus-indica* became a serious invasive weed in South Africa, and the most famous species of cochineal, *Dactylopius coccus*, was introduced into the Kariega (formerly Uitenhage) region to be harvested for the carminic acid, after some synthetic red dyes in foods, cosmetics, and pharmaceuticals were banned because they posed a potential risk to human health (Zimmermann 1989). Dr. Helmuth Zimmermann, a well-known scientist working on invasive weed control in South Africa, had successfully managed a large land area covered by *Opuntia ficus-indica* by infesting it with *D. coccus*. His team harvested a large amount of this cochineal and dried it. Unfortunately, some of the cochineal was heavily contaminated with dirt and cactus spines, so it found no buyers. They gladly sold 23 kilograms of this cochineal to Pahlen after she visited Anna Viljoen, president of the Pretoria Weavers Guild. Pahlen sifted it and sorted out the spines. This was the only source of the cochineal that was used to dye the handspun yarns of silk of *Gonometa rufobrunnea* in Botswana and Germany. Prior to the introduction of *D. coccus*, Zimmermann and colleagues cleared a much larger area of the invasive *Opuntia* using *Dactylopius opuntiae* (Cockerell), a successful example of biological control.

Pahlen prepared the cochineal dye as follows, using some tips from Van de Vrande (1979, 1982). A selected amount of cochineal was ground in an electric coffee grinder, for example 25–30 g on 100 g yarn, depending on the planned depth of color and if a second or third dye bath was wanted. Cochineal was ground into a fine powder, soaked in a stainless-steel pot for 30 min. in warm tap water to the consistency of a sticky paste. The paste was heated and boiled with a little additional water for 10 min., after which a squirt of pH-neutral dishwashing liquid was added. The mixture was stirred, poured into a 10-liter pot of warm water for 500 g of yarn, thoroughly stirred, and heated to 65° Celsius for about 10–30 min. It was sifted by pouring the cochineal solution through a fine mesh cloth into the dye vessel and topped up to 15 liters with water. The dye bath must not be warmer than 65° Celsius. Cream of tartar ($KC_4H_5O_6$), 6 g on 100 g yarn, was dissolved in hot water and added to the dye bath. The silk was premordanted with alum for 1 h and immersed wet into the dye bath and continually rotated during the first 5–10 min. using two sticks. The rotation secured a uniform absorption of the color. The silk was kept for 1 h in the 65° Celsius dye bath, then aired to drip off and, when almost dry, rinsed in warm water. By adding a tablespoon of conditioner for colored hair to the last rinse, the yarn was easier to untangle and the brilliance of the color was enhanced. The outcome of the dye process was influenced by borehole water (well water) with limestone or tap water with chlorine. For very dark hues (see the darkest threads in Figs. 17, 18, 20) 75 g of finely ground cochineal for 100 g silk and 6 g of technically clean tartaric acid was used.

Conclusion

We believe that the late Peter Becker, a German national born in Kenya, should be credited for his vision to develop this wild silk industry toward poverty alleviation of local people in Botswana in a sustainable way. In keeping with this, many lessons were learned from the successes and failures of Shashe Silk as well as the small-scale projects that Pahlen initiated and supported for many years. These huge and small ventures provided employment opportunities and diverse learning activities for hundreds of local people.

Regarding future prospects, the development of a large and profitable business venture by Shashe Silk to harvest, process, and market silk of *Gonometa rufobrunnea* proved that this species has great potential for commercial exploitation. However, future workers must pay attention to timing of the cycles of the population outbreaks of the insect. Keeping in mind that the 438 tons cited earlier consisted primarily of empty cocoons from previous years, it is imperative to find ways to treat this silkmoth as a renewable resource by training those who collect cocoons to not take viable cocoons as far as possible (Veldtman et al. 2002). However, where profit is involved, many participants will inevitably take viable cocoons. A possible solution would be to separate viable cocoons from the total collected and hold them at that locality until the moths emerge and fly free. The cocoons are not easy to harvest, because most are attached to branches of thorny trees (because the caterpillars move from the thornless mopane trees to spin), and many are too high to easily reach. These limitations would help to ensure that harvesting cocoons would be unlikely to eliminate any of the moth populations. Obviously, rural people in developing countries should be encouraged to try to earn money by tapping the biological resources that are accessible, so long as these activities are done responsibly with regard to sustainability and the environment. Nethavhani (2024) demonstrated that mopane worms (*Gonimbrasia belina*), which also feed on mopane, are currently under threat by overexploitation, but these insects are easier to harvest than *Gonometa* cocoons. Moreover, clearing mopane woodlands poses a greater threat to *G. rufobrunnea* than sericulture.

There exists a lot of expertise in Botswana, Namibia, and South Africa regarding entomology, ecology, and sericulture (processing and marketing), but entrepreneurs from India, China, and Japan may also play future roles in this development, as seen by the Japanese initiatives for wild silks in Ethiopia and Indonesia that have been successful (Peigler 2020: 736-738). Some of these projects involve mass rearing of the larvae of the silkmoths, but cocoons of *Attacus atlas* (Linnaeus) and *Cricula trifenestrata* (Helfer) in central Java are pests of cultivated trees like mahogany (*Swietenia mahagoni*), guava (*Psidium guajava*), avocado (*Persea americana*), and tea (*Camellia sinensis*), so cocoons are actively removed as far as possible, leading to sericultural use. No mass rearing is done in Java for *Cricula* and *Attacus*, but sustainability is not a concern because these species are considered pests. Paukstadt and Paukstadt (2019) offered a detailed account of the wild silk exploitation in central Java. Sericulture is ingrained in many cultures in Asia, but not in Africa. We do not believe that *Gonometa* are amenable to mass rearing in Africa for such cultural reasons as well as ecological constraints. However, innovative attempts to mass rear *G. rufobrunnea* should certainly be explored.

Acknowledgments

We are most grateful to Ian S. C. Parker for generously sharing information from his work with *Gonometa* and Shashe Silk. He also directed us to additional literature cited in this article.

Peigler benefitted greatly from his correspondence with Richard C. B. Hartland-Rowe (1927-2012) in the 1990s; he provided the specimens shown in Figs. 1, the image for Fig. 2, and copies of some of the African literature cited here. Ruan Veldtman of Stellenbosch University was a gracious host to Peigler on a visit to Western Cape Province in 2018 and sent images for our Figs. 3-4. Daniel A. Reboussin and Steven L. Hersh, librarians/archivists at University of Florida, connected Peigler to Ian Parker and provided some information from his archive.

Pahlen knew Hartland-Rowe personally and he kindly gave her useful information on the life cycle, nutritional requirements, and habitat of *Gonometa rufobrunnea*. Peter Becker was always maximally supportive to provide space and material for the handspinning project and gave insight on harvesting, purchase, and processing the cocoons at the factory. Estelle Byrne of Tswana Weaving is thanked for making the contact to Becker. Anna Viljoen of the Pretoria Weavers Guild made the contact to H. Zimmermann in Uitenhage and introduced Pahlen to the German-born master weaver Waltraud Hindloev, who taught her selected patterns best suited for handspun silk. Catrien Van Waarden, curator of Supa Ngwao Museum, and Stella Rundle marketed the Kalahari wild silk in the museum shop and displayed it in some exhibitions. Rita Buchanan connected Pahlen with Peigler, realizing their shared interest in wild silks.

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Announcements:

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 David Fine 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.

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. Follow the Society's facebook page for updates on future meetings and potential field trips at **https://www.facebook.com/societykentuckylep/**.

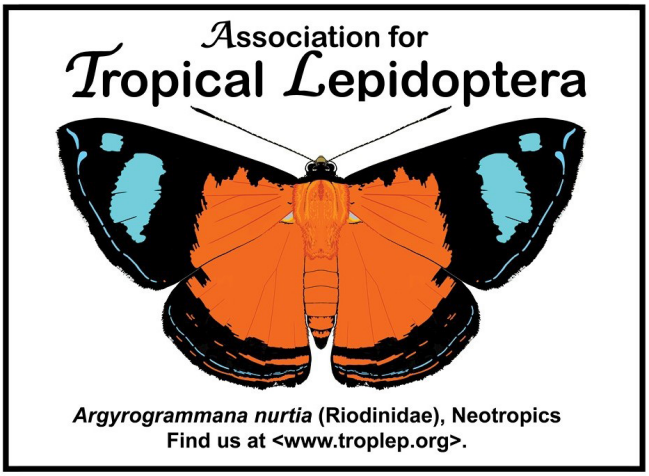
To join the Society of Kentucky Lepidopterists, send dues to: Les Ferge, 7119 Hubbard Ave., Middleton, WI 53562.

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.

The Association for Tropical Lepidoptera

This society, founded in Gainesville in 1989, is a global network of professional and amateur lepidopterists who share a passion for studies and photography of the butterfly and moth faunas of the tropics. Our full-color biannual journal, Tropical Lepidoptera Research, is legendary for its scientific content, superb editing, and spectacular illustrations. Among the benefits of ATL membership are: discounted page charges for authors; engaging annual meetings (customarily held jointly with the Southern Lepidopterists' Society), and periodic emailed UPDATES which describe the activities of this and other lepidopterology societies whose focus is on the tropics. Dues are $95 per year for regular members in the USA ($80 for new members) and $50 for students. Please see our website (troplep.org) for further information and for samples of the journal. Dues may be paid to the ATL Treasurer, P.O. Box 141210, Gainesville, FL 32614-1210 USA. We will welcome your participation in our shared celebration of biodiversity at its best!



Neotropical riodinid adopted in April 2025 as ATL's NEW LOGO. Photo by David H. Ahrenholz, image rendering by Deborah L. Matthews.

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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: **kerichers74@gmail.com**; 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!

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**

73rd Annual Meeting of the Lepidopterists' Society -- July 30 - August 3

Clarion Inn Sierra Vista, 39 East Fry Boulevard, Sierra Vista, AZ 85653, (520) 459-4221. The Clarion Inn Sierra Vista is located on East Fry Boulevard, and can be reached directly east off of Buffalo Soldier Trail or west off Rt. 92.

Hosted by Kelly Richers, Chuck Harp and Todd Gilligan.

Schedule:
Tuesday, July 29: Wedge Foundation meeting preceding the LepSoc meeting
Wednesday, July 30: Executive Council Meeting, 9:00 a.m. until completed (by 3 p.m.)
Welcome Reception at hotel, possible field trip
Thursday, July 31: Presentations, possible field trip
Friday, August 1: Presentations
Barbeque at Veterans Memorial Park
Saturday, August 2: Presentations if needed (a.m.)
Business meeting (p.m.)
Banquet by Orient Express Restaurant
Sunday, August 3: Leave the meeting, day trips possible

Note: If you have any dietary preferences or restrictions, please reach out to the meeting organizers at **meeting@lepsoc.org, s**o that we can accommodate your request.

Registration:

Registration is now open! Go to **https://lepsoc.org/event/2025-annual-meeting/** to register.

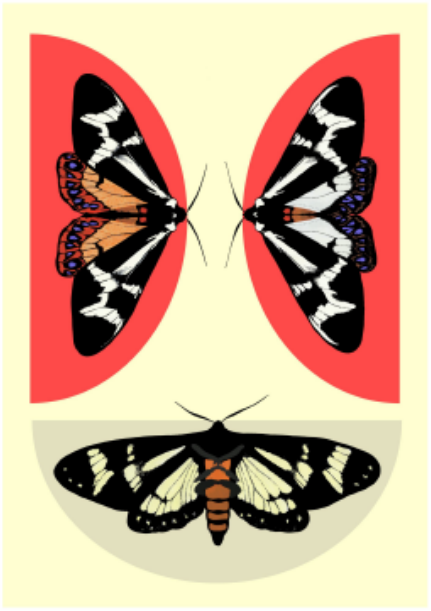
Registration includes access to all field trips, the welcome reception Wednesday evening, presentations on Thursday, Friday, and Saturday, and informal moth collecting/observing most nights. BBQ (Friday night) and Banquet (Saturday night) tickets

Meeting (Members $180), includes BBQ and Banquet
Meeting (Students $90), includes BBQ and Banquet
Meeting (Non-Members $200), includes BBQ and Banquet
Additional BBQ tickets ($29/each), arrangements for serving alcohol are being made
Additional Banquet tickets ($50/each), cash bar will be open at banquet plus each seat gets one drink ticket

We will likely use the now-familiar numbered tickets to attach to each registration package, one for completed registration, one for the banquet, one for the BBQ.

Rooms (Separate, not included in registration costs):

Rates at the Clarion Inn are (subject to change):
$119 per night, King single or double occupancy
$139 per night, Double single or double occupancy
$169 per night, Queen Suite, single or double occupancy
Rooms are subject to Tax and local fees



We have a block of rooms reserved at the Clarion. Please ask for the Lep Soc meeting rates when calling for a reservation. There are many other hotels and lodging options available in Sierra Vista with a variety of prices. There are also many camping options in the area, ranging from RV parks to KOAs to State Parks. Book early!

Sierra Vista:

The Sierra Vista area provides an outstanding array of scenery, western history, and opportunities for exploring a diverse flora and fauna. The location for two previous Lepidopterists' Society meetings, Sierra Vista is a modern city of 50,000 people that is most well-known for Fort Huachuca, home of the Army's famed Buffalo Soldiers. Sierra Vista is located on the southwestern side of Cochise County and is 15 miles southwest of the historic town of Tombstone, 20 miles northwest of Bisbee, and 16 miles from the border of Mexico.

The area around Sierra Vista is home to some of the most famous Lepidoptera collecting locations in the entire country. Field trips will include both collecting and observing, which will feature both daytime and night collecting trips to lower Carr Canyon and other local canyons depending on the weather. Also within close reach are Ramsey Canyon, Carr Canyon, Miller Canyon and Ash Canyon, as well as the desert east of the city. Within driving distance is the Coronado National Memorial, Guadalupe Canyon, and other locations near Portal. The Huachuca Mountains just west of town offer some of the most diverse habitat in Arizona, from lower riparian habitat to high elevation campsites and observation/collecting areas.

Call for Contributed Papers

To submit a contributed paper, please download the PDF available at the meeting link, fill it out, and send it to Kelly Richers at **meeting@lepsoc.org**. The deadline for submitting a paper is June 20th.

For more information, visit **https://www.lepsoc.org/event/2025-annual-meeting/**. See you in Sierra Vista!

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

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

Eagle Hill Institute's 2025 Entomology and Related Seminars

Eagle Hill is right on the coast of Eastern Maine, between Acadia National Park and Petit Manan National Wildlife Refuge.

Jun 22–28 • Light Trapping and Lepidoptera: Artificial Light as a Tool for Collecting Moths and Caterpillars • Avalon Owens & Michael LaScaleia

Jul 6–12 • The Ecology and Identification of Dragonflies and Damselflies (Odonata) • Bryan Pfeiffer

Jul 20–26 • EPT Taxa: Mayflies, Stoneflies, and Caddisflies • Steven Burian

Aug 31–Sept 6 • Microlepidoptera: Biology, Ecology, and Identification • Jason Dombroskie

For general information, the registration form, seminar flyers, and a complete calendar:

https://eaglehill.us/programs/sems-weeklong/calendar-weeklong.shtml

If you have any questions about the content of the seminar, please reach out to the seminar instructor(s), whose contact info can be found on the seminar flyer. If a seminar you are interested in is full, and you would like to be put on the waitlist, please fill out the application form.

If you have any questions about registering for the seminar, please contact us at office@eaglehill.us.

This year's Leuschner Award Recipients

Cailyn Haubein, Papeş Lab, Dept. of Ecology and Evolutionary Biology, University of Tennessee Knoxville

Moths, highly diverse and reliant on plant resources, serve as indicators of ecological changes post-fire. My research investigates how fire management influences moth communities by assessing moth functional and taxonomic diversity across prescribed burn and wildfire sites. I aim to inform forest management practices to enhance biodiversity and ecosystem health.

Helen Oker, University of Wisconsin-Madison (Entomology)

Project Description: In response to severe defoliation by the invasive spongy moth (*Lymantria dispar*), aspen trees (*Populus tremuloides*) alter their chemical defenses. This study will explore how phytochemical shifts in aspen leaves affect spongy moth larval performance and immunity, providing insight into plant-insect interactions and informing management strategies for this invasive species.

Lymantria dispar larva on *Populus tremuloides*. (image by Celso Ricardo de Oliveira Júnior).

Gbolahan Anthony Reis, Program in Ecology, Dept. of Biology, Utah State University, Logan, Utah

Climate change poses a significant threat to butterfly populations, directly and indirectly affecting their survival. While research has predominantly addressed direct effects, the indirect effects of climate change remain less explored. I propose to investigate the indirect impacts of increasing temperatures and drought on *Lycaeides melissa* (the Melissa blue butterfly) through changes in the chemical composition of its nonnative host plant, *Medicago sativa*, under controlled laboratory conditions. My goal is to quantify the relative contributions of direct and indirect effects of these stressors on caterpillar performance. These findings will inform climate-sensitive conservation strategies for Lepidoptera.

The Melissa Blue Butterfly (*Lycaeides melissa*)

New Website & Member Login!

Please take a moment to explore our new website, which should appear identical to our old website. Our membership directory is now being managed in a new system, and our Member ID numbers are no longer used to login. Please direct yourself to https://lepsoc.org/membership-account/ and use the "forgot password" feature to set yourself a new login. You can then log in with your email and a new password. Once in please edit your profile and toggle defaults for category preferences (default currently set to YES, including "omit address from Directory"!). And don't forget to register for LepSoc 2025!

Many thanks to our new webmaster Megan McCarty, who can be contacted at webmaster@lepsoc.org for any questions or comments about the new site. We owe a special debt of gratitude to our previous webmaster team, Ella and Todd Gilligan for their years of service to the Society.

Lepidoptera Course August 4—14th, 2025

www.lepcourse.com

Join us for a 10-day field course at the Southwestern Research Station in Portal, Arizona. Designed for students, amateur naturalists, conservation biologists, and other biologists who have an interest in learning more about the Lepidoptera. We will emphasize taxonomy, ecology, and field identification of lepidopterans in Southeastern Arizona. Lectures will include background information on the morphology, biology, and ecology of leps and their importance in pollination biology. Field trips will provide participants with collecting, sampling, and observation techniques; and lab work will provide instruction on specimen identification, preparation, dissection, and curation. Costs for 10 days inclusive of fees, room, and board: $1,900. Email **swrs@amnh.org** for an application, or contact Chris Grinter at **cgrinter@calacademy.org** for more information on the course. Space is strictly limited to 15 participants.

Lep Soc Statement on Diversity

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

James and Brian's excellent adventure:
Mothing in the plains and mountains to and from the 2023 Lep Soc meeting in Billings, Montana. Part 3

James K. Adams[1] and Brian G. Scholtens[2]

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[2]Biology Department, College of Charleston, 66 College St., Charleston, SC 29424 **scholtensb@cofc.edu**

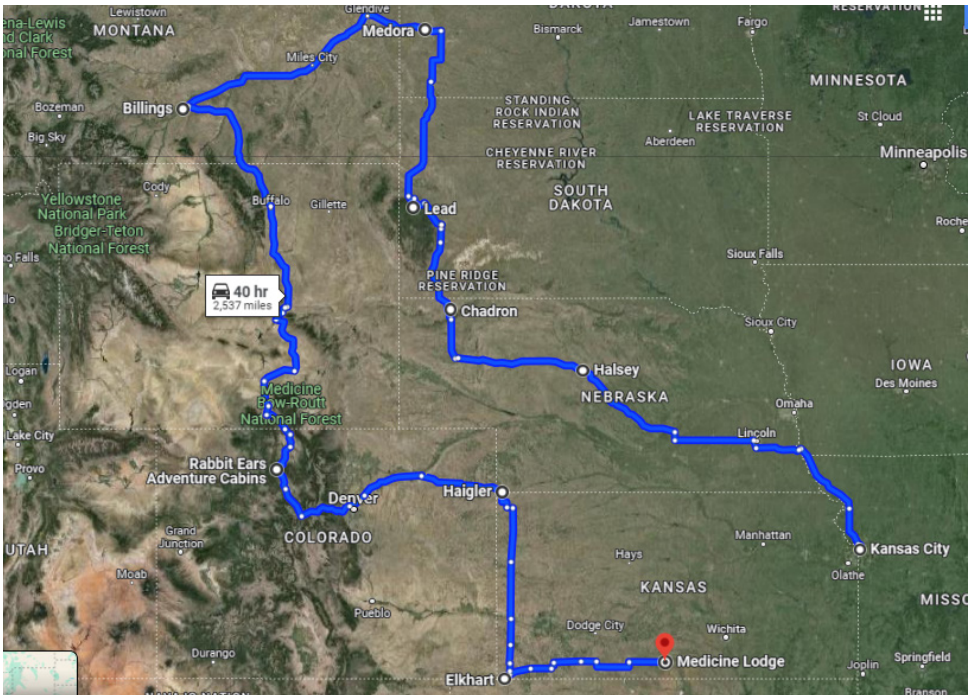


Fig. 1. The mothing "loop" trip of summer 2023. The last part of the loop is discussed in this article, from Haigler, NE to Elkhart to Medicine Lodge, KS. Image captured from Google Earth.

This is the final installment of this three-part adventure -- a long loop trip (Fig. 1) that Brian Scholtens and I (JKA) enjoyed in association with the 2023 Lepidopterists' Society meeting in Billings, Montana.

After I visited my family in Boulder, and Brian had an interesting night collecting on the eastern plains of Colorado at Sterling, we planned to reconnect for several nights of collecting in Kansas. I have spent quite a number of nights collecting the edges and corners of the state of Kansas and planned our last three stops based on the wonderful habitats and moths I have taken at these locations in the past.

The first stop (night of July 28) was to visit the Arikaree Breaks and Devil's Canyon (Figs. 2-5) in extreme northwestern Kansas (Cheyenne Co.). This dry ridgeline and canyon habitat is very unlike what most people think of when thinking of Kansas. Brian and I stayed at a B&B owned by the Petersons in Haigler, Nebraska, just a few hundred yards north of the Kansas border. Simply called "The Lodge" (Fig. 6), it was the same price per night ($130.00) as the small cabin at Rabbit Ears Pass, but at least eight times bigger, with three separate bedrooms, a dining room, fully functional kitchen . . . in

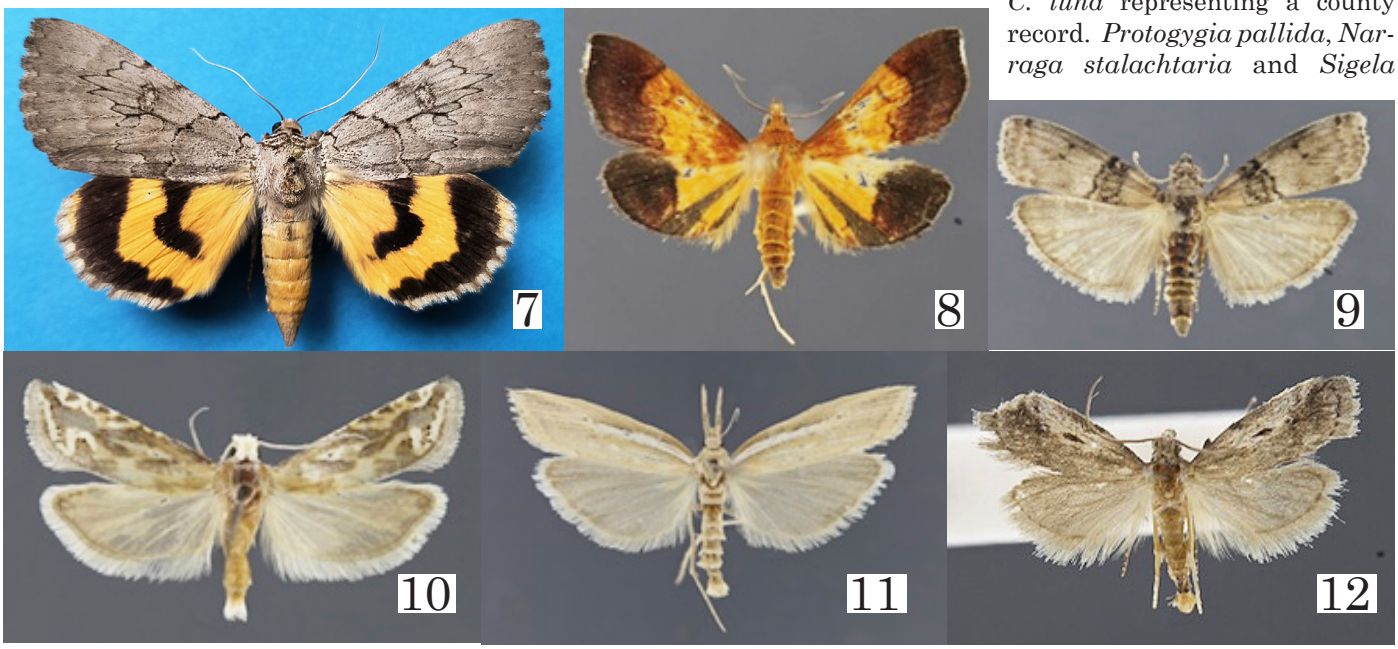
Fig. 2. The topography of the Arikaree Breaks area in extreme northwest Kansas. The "canyon" west of "Wano" is Devil's Gap. **Fig. 3.** An image of a trapping spot in the Arikaree Breaks area.

Fig. 4. Looking down into Devil's Gap. **Fig. 5.** Looking up into Devil's Gap from below.

Fig. 6. "The Lodge", owned by the Petersons in Haigler, NE.

other words, a house! And, although the Petersons kept the immediate yard well-manicured, we put up lights and a bait trap in the yard and ended up with a lot of moths coming to the lights from the surrounding environment the first night. Especially notable was an abundance and diversity of *Schinia* (a theme that would continue at our next location). Several moths were records that extended ranges significantly westward in Nebraska, such as *Tlascala reductella, Pyrausta bicoloralis*, and a specimen of *Catocala illecta* at bait (Figs. 7-9). Even more, we got three state records (*Pelochrista serpentana, Thaumatopsis pectinifer*, and *Alpheioides parvulalis*) right there in the yard as well (Figs. 10-12).

We picked up the traps out in the Arikaree Breaks habitat the next morning. The night had been quite windy, and a couple of the traps were a bit ineffective, but we still got a significant number of moths (Fig. 13-14). Excellent catches included the two state records of *Ectypia clio* (Fig. 15) and *Xylomoia chagnoni* (Fig. 16), which I had also taken in Halsey, NE earlier in the trip. *Copablepharon grandis* and *Cucullia luna* (Fig. 17) were also nice records, with *C. luna* representing a county record. *Protogygia pallida*, *Narraga stalachtaria* and *Sigela*

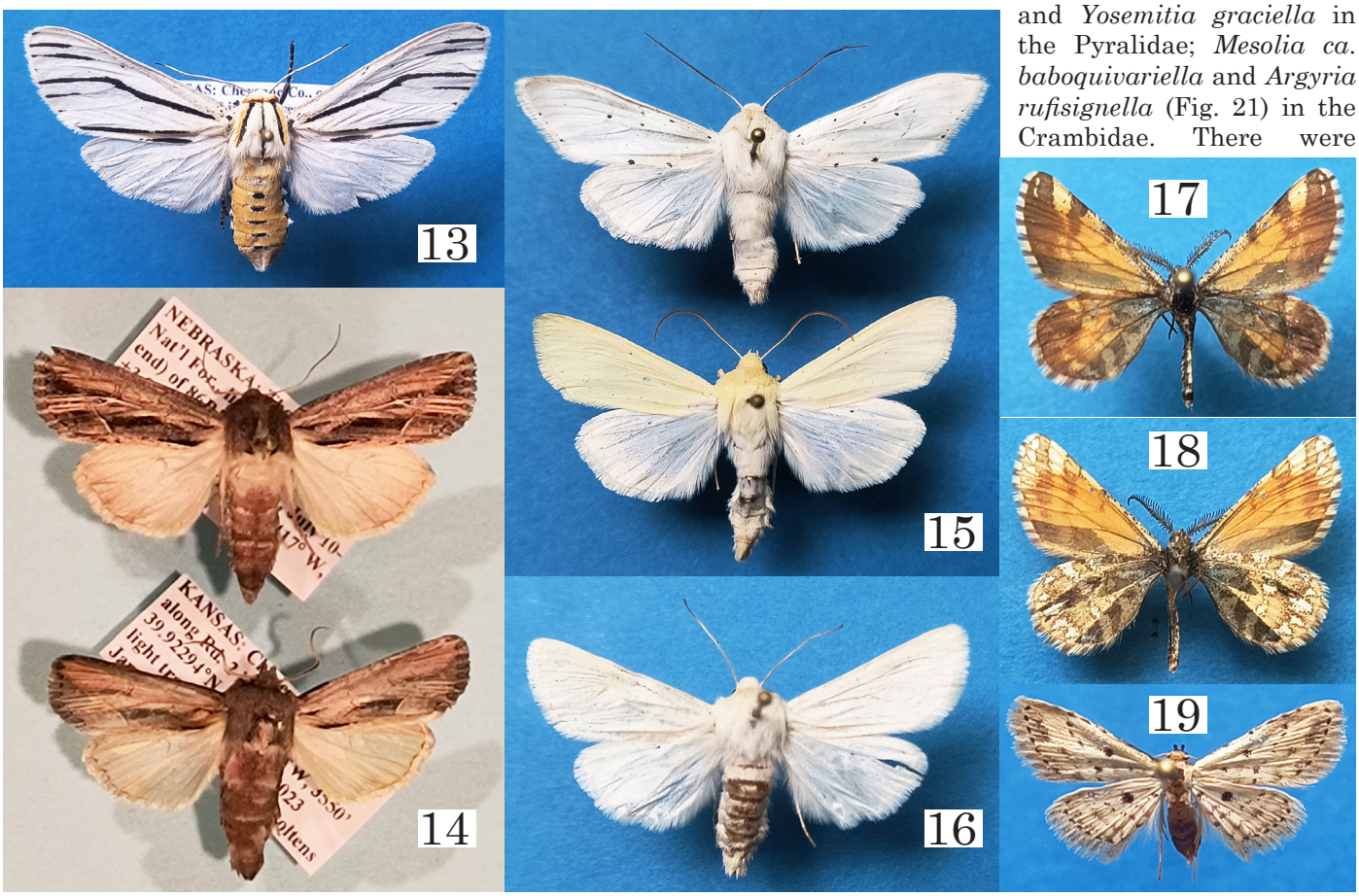


Figs 7-9. Westward range extensions in Nebraska: *Catocala illecta, Pyrausta bicoloralis, Tlascala reductella*. **Figs. 10-12.** Nebraska state records: *Pelochrista serpentana, Thaumatopsis pectinifer, Alpheioides parvulalis*.

Fig. 13. Some of the moth catch from Devil's Gap. **Fig. 14.** Brian considering adding a little "micro" protein to his breakfast.

basipunctaria (the farthest north this one has been taken) (Figs. 18-20) would have been state records if JKA had not taken them at this same place on previous trips. Finding lighter orange *N. stalachtaria* in the piles of moths is a chore, because there were hundreds of *N. fimetaria* for each *N. stalachtaria*. We would see *S. basipunctaria* again at the next stop (Cimarron).

Even with the failure of a couple of traps, the number of interesting micros was very high. That was true at the last two spots in Kansas also, indicating that relatively little micro collecting has been done previously. Brian got at least 7 state records: *Eucosma indagatricana* in the Tortricidae; *Alpheioides parvulalis* (see previous page), *Aglossa cacamica*, *Sosipatra rileyella* (Fig. 20), and *Yosemitia graciella* in the Pyralidae; *Mesolia ca. baboquivariella* and *Argyria rufisignella* (Fig. 21) in the Crambidae. There were



Figs. 13-14. Kansas state records (Devil's Gap): *Ectypia clio, Xylomoia chagnoni*. **Fig. 15.** Top: *Cucullia luna*; bottom: *Copablepharon grandis*. **Fig. 16**. *Protogygia pallida*. **Figs. 17-18.** *Narraga stalachtaria* (upperside and underside). **Fig. 19.** *Sigela basipunctaria*.

Figs. 20-21. Kansas state records (Devil's Gap): *Sosipatra rileyella, Argyria rufisignella*. **Fig. 22.** *Hahncappsia coloradensis*. **Fig. 23.** Great Plains Toad (*Anaxyrus cognatus*).

several other species that were 2nd records for the state. One moth, *Hahncappsia coloradensis* (Fig. 22) is only in the western part of Kansas but was particularly abundant in this habitat (and also at the Cimarron – our next stop). While we were picking up the traps, we found a delightful little toad, *Anaxyrus cognatus*, appropriately called the Great Plains Toad (Fig. 23).

The second night in the Haigler/Devil's Gap area was the ONLY night of the entire trip that the weather stopped us from trapping. A cold front came through and provided us with a significant lighting storm. Though there was not a lot of rain, the wind was strong and the air much cooler. Lights at the Lodge set after the storm rolled through attracted little.

From extreme NW Kansas we travelled to the Cimarron National Grasslands in extreme SW Kansas (Morton Co.), spending two nights in Elkhart on the Oklahoma border. I had always found this location to be highly productive moth-wise, and this trip turned out to be no different. The grasslands are north of Elkhart (Fig. 24), with several dirt roads traversing the habitat. The Cimarron was lush and in full bloom (Figs. 25-26), and, as usual, the Cimarron River (Fig. 27-28) was a non-existent dry, sandy riverbed. We set traps in several places, mostly not far from the riverbed (Fig. 29) where there are small sandy rises that help protect the traps from the wind. And even though it was near the full moon, the volume of the catch from the traps was astounding, the most moths we had seen in one night on the entire trip. It took us from a little past 8:00 a.m. in the morning until 4:30 p.m. to entirely sort the moths and select specimens (see Fig. 30 for a portion of the field pinned specimens). Again, the *Schinia* were

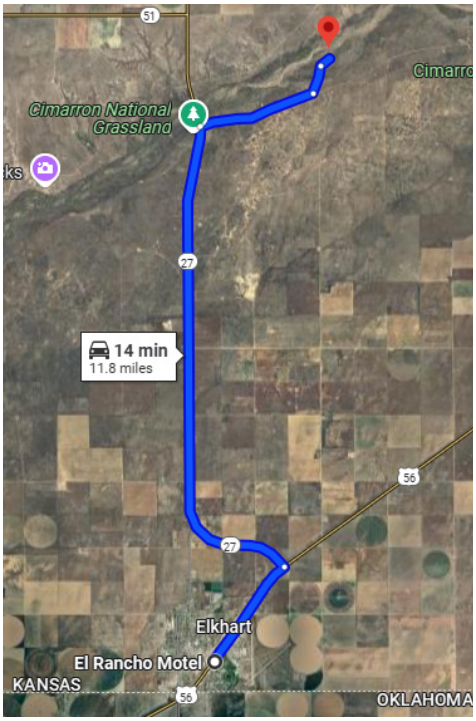
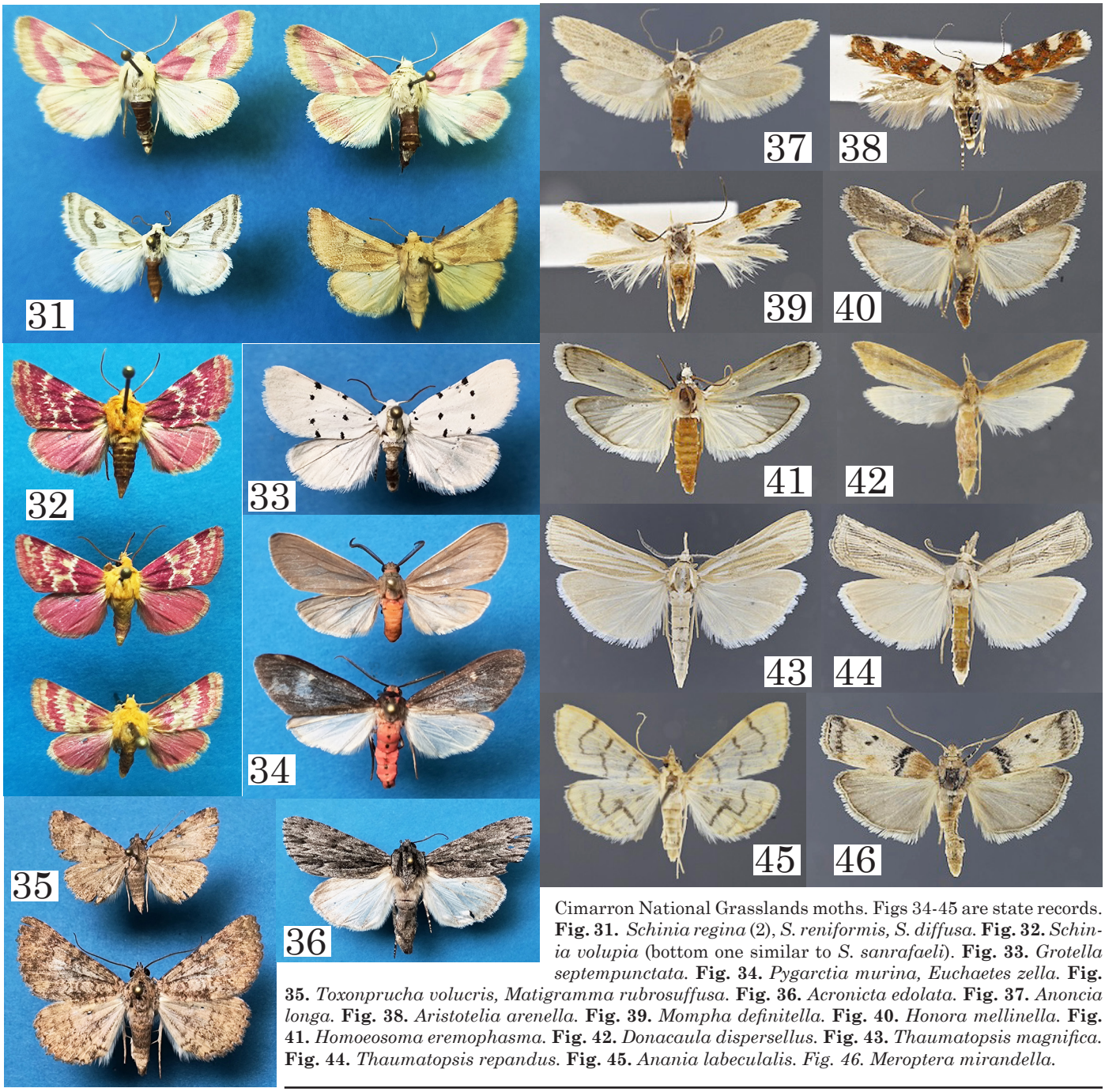


Fig. 24. Cimarron National Grasslands topography. El Rancho Motel is in Elkhart, and the main trapping site (indicated by the red pin) is along the Cimarron "River". Image from Google Maps.

Figs. 25-26. Cimarron National Grasslands habitat, late July 2023. The bloom was incredible -- Kansas really is the sunflower state. The bottom image shows one of the roads, headed back towards the line of trees along the Cimarron "River."

Figs 27-28. Cimarron National Grasslands near the Cimarron "River" -- overhead view (roads and "river") and ground view. The "river" has not had water in it during any of my visits, though clearly there is ground water supporting the riparian habitat on the banks. **Fig. 29.** The main trapping site near the "river" within the image above. **Fig. 30.** A portion of the field pinned specimens from the night of trapping -- note the abundance of *Schinia*.

spectacular, both in abundance and diversity (20 species at least), though perhaps only *Schinia diffusa* was new for the area, again because of my and others' previous visits. The most abundant species were *Schinia regina* and *S. reniformis* (Fig. 31). There were some lovely morphs of *S. volupia* (including one that looks a bit like *S. sanrafaeli*; Fig. 32). *Grotella septempunctata* were numerous as well (Fig. 33). Indeed, the volume was SO much that Brian convinced me not to trap the second night, simply because there would be no way to sort the catch and move on to the next location the following day! Some of the most exciting catches included the arctiine erebids *Pygarctia murina* and *Euchaetes zella* (Fig. 34) as well as *Toxonprucha volucris* and *Matigramma rubrosuffusa* (this last species I had taken here previously; Fig. 35), with the first three being state records. *Acronicta edolata* (Fig. 36) also may be a state record.



Cimarron National Grasslands moths. Figs 34-45 are state records. **Fig. 31.** *Schinia regina* (2), *S. reniformis, S. diffusa.* **Fig. 32.** *Schinia volupia* (bottom one similar to *S. sanrafaeli*). **Fig. 33.** *Grotella septempunctata.* **Fig. 34.** *Pygarctia murina, Euchaetes zella.* **Fig. 35.** *Toxonprucha volucris, Matigramma rubrosuffusa.* **Fig. 36.** *Acronicta edolata.* **Fig. 37.** *Anoncia longa.* **Fig. 38.** *Aristotelia arenella.* **Fig. 39.** *Mompha definitella.* **Fig. 40.** *Honora mellinella.* **Fig. 41.** *Homoeosoma eremophasma.* **Fig. 42.** *Donacaula dispersellus.* **Fig. 43.** *Thaumatopsis magnifica.* **Fig. 44.** *Thaumatopsis repandus.* **Fig. 45.** *Anania labeculalis. Fig. 46. Meroptera mirandella.*

There were many state records in the micros (Figs. 37-45), picking up things from the west and southwest that had not previously been recorded in Kansas. Both *Anoncia leucoritis* and *A. longa* in the Cosmopterigidae were common (*leucoritis* especially at our next stop also). At least three Gelechiidae were state records, *Aristotelia arenella* (described recently by Sangmi Lee), *Aristotelia lespedezae*, and the introduced species *Ornativalva erubescens*. *Mompha definitella* was one of a few species in that genus, but the only one that was a state record. If I have the identifications correct, two Pterophoridae were state records, *Hellinsia venapunctus* and *H. citrites*. At least three tortricids were recorded for the first time, *Platynota labiosana*, *Pelochrista agricolana*, and *P. daemonicana*. In the Pyralidae *Sosipatra rileyella* was found here also, *Honora mellinella* and *Homoeosoma eremophasma* were state records and *Meroptera mirandella* (Fig. 46) was found for the 2nd time in the state. Finally, a whole slew of Crambidae were found as state records, *Donacaula dispersellus*, *Haimbachia squamulellus*, *Thaumatopsis magnifica*, *Thaumatopsis repandus*, *Loxocrambus coloradellus*, *Diastictis robustior*, *Framinghamia helvalis*, and *Anania labeculalis*. In addition, *Mesolia ca. baboquivariella* and *Argyria rufisignella* were found here also along with the relatively uncommon *Pyrausta pseuderosnealis*. It was a very productive night!

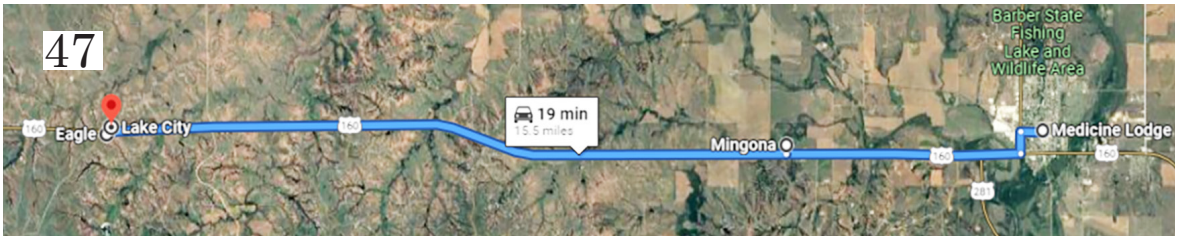


Fig. 47. Hwy. 160 west from Medicine Lodge, KS. The Red Hills habitat is on the left, with the red pin at the "Tumbleweed Road" trapping site. **Fig. 48.** The Tumbleweed Road topography. **Fig. 49.** This image shows the red soil at our trapping site north of highway 160 at Tumbleweed Rd.

With a good night's rest and no moths to sort the next morning, we got on the road early and headed for Medicine Lodge, Barber Co., in south central Kansas. Barber Co. is home to the Red Hills, or Gyp Hills (so named for the deposits of gypsum just below the surface soil). We stayed at the Copa Budget Inn in Medicine Lodge, and Brian started our visit there by catching a Mexican Sulphur (*Eurema mexicana*), uncommon in the state. Fifteen miles west of Medicine Lodge is the heart of the Red Hills, and there is a pull-off on either side of Hwy. 160 near Tumbleweed Road (Figs. 47-49). It is private property, but I know the landowners and they have no problem with our trapping for moths. The red soil supports an interesting flora, which leads to some significant diversity of moths. Because of the fact that I have been here so many times before, and perhaps because of the full moon, the macromoth diversity was familiar and without many surprises. There is an undescribed and very common species of *Hemeroplanis* (Fig. 50) that I have captured here every time I've visited in the summer, and this summer was no different – the red color is clearly adapted to the soil. We collected a *Drasteria* that is either *fumosa*, which would be a state record, or something undescribed (Fig. 51). *Cisthene barnesi*, which we had encountered in more than one place in Nebraska, in North Dakota and multiple places in Kansas, was at least a county record virtually everywhere, and a likely state record in a couple of these states. Unlike the familiar macro fauna, this area was the MOST productive for new micro records of any on our trip, so much so that the significant finds are compiled in Table 1. One example, *Ethmia burnsella* (Plate 1), seems to be known from very few specimens at all (none from Kansas), and we found it here in some numbers. The species found

Red Hills moths. **Fig. 50.** An undescribed and very common species of *Hemeroplanis* from the Red Hills **Fig. 51.** A specimen of *Drasteria*, either a state record for *D. fumosa* or an undescribed species.

Table 1: Significant micro moth finds near Medicine Lodge, Barber Co., Kansas, August 1-3, 2025.

Family	Species	Significance
Tineidae	*Amydria curvistrigella*	State record
Tineidae	*Eccitothrix guenterella*	2nd record
Depressariidae	*Ethmia burnsella*	State record
Depressariidae	*Ethmia hagenella*	State record
Depressariidae	*Ethmia mirusella*	2nd record – abundant
Cosmopterigidae	*Anoncia longa*	Also here
Gelechiidae	*Aproaerema nigrella*	State record
Gelechiidae	*Aproaerema palpilineella*	2nd record
Gelechiidae	*Dichomeris isa*	2nd record
Gelechiidae	*Aristotelia pudibundella*	2nd record
Gelechiidae	*Filatima albilorella*	State record – abundant
Gelechiidae	*Phthorimaea operculella*	2nd record
Momphidae	*Mompha circumscriptella*	2nd record
Momphidae	*Mompha definitella*	Also here
Tortricidae	*Phtheochroa aureoalbida*	State record
Tortricidae	*Choristoneura parallela*	State record
Tortricidae	*Cenopis diluticostana*	2nd record
Tortricidae	*Eucosma pallidicostana*	State record
Tortricidae	*Pelochrista canana*	Likely State record
Tortricidae	*Pelochrista erema*	State record – newly described
Tortricidae	*Epiblema luctuosissima*	Possible State record
Tortricidae	*Epiblema benignata*	2nd record – abundant
Tortricidae	*Gretchena amatana*	2nd record
Tortricidae	*Catastega aceriella*	2nd record
Tortricidae	*Grapholita fana*	State record
Pyralidae	*Alpheioides parvulalis*	Also here
Pyralidae	*Pococera scortealis*	2nd record
Pyralidae	*Pococera griseella*	State record
Pyralidae	*Pococera humerella*	Few records
Pyralidae	*Pococera baptisiella*	2nd record
Pyralidae	*Pococera euphemella*	State record
Pyralidae	*Acrobasis indigenella*	State record
Pyralidae	*Euzophera semifuneralis*	State record
Pyralidae	*Salebriaria roseopunctella*	State record
Pyralidae	*Psorosina hammondi*	State record
Pyralidae	*Meroptera cviatella*	2nd record
Pyralidae	*Sciota subfuscella*	State record
Pyralidae	*Sciota subcaesiella*	2nd record
Pyralidae	*Sciota rubrisparsella*	Uncommon – abundant here
Pyralidae	*Adelphia petrella*	State record
Pyralidae	*Honora mellinella*	Also here
Pyralidae	*Laetilia fiskeella*	State record
Pyralidae	*Anderida sonorella*	State record
Pyralidae	*Peoria bipartitella*	2nd record
Pyralidae	*Atascosa glareosella*	State record
Crambidae	*Leptosteges vestaliella*	2nd record
Crambidae	*Donacaula unipunctellus*	State record
Crambidae	*Donacaula dispersellus*	Also here
Crambidae	*Donacaula nitidellus*	State record
Crambidae	*Prionapteryx indentellus*	2nd record
Crambidae	*Haimbachia squamuelellus*	Also here
Crambidae	*Eoreuma densellus*	State record
Crambidae	*Argyria rufisignella*	Also here
Crambidae	*Fissicrambus hemiochrellus*	2nd record
Crambidae	*Parapediasia decorellus*	State record
Crambidae	*Abegesta reluctalis*	Abundant
Crambidae	*Palpita quadristigmalis*	2nd record
Crambidae	*Mecyna submedialis*	State record
Crambidae	*Mimorista trimaculalis*	State record – abundant
Crambidae	*Crocidophora pustuliferalis*	State record

show that this area is a complex mix of species from the Southwest, Texas, and the East. Plate 1 shows a sampling from this list.

Four miles west of Medicine Lodge there is a pull-off to the north that runs out to an oil pump (Fig. 52). Riparian habitat runs along a creek and there is rich field habitat beside lines of trees. I have taken some very interesting moths here, and very different from eleven miles further west at Tumbleweed Road. We didn't take much of anything unusual this trip, but a bait trap hung here did attract the largest number of Goatweed Butterflies (*Anaea andria*) I have ever experienced anywhere (Fig. 53 and 56). And, to top everything off, I kept telling Brian we would see a Horned Lizard somewhere on the trip. I was beginning to think it wouldn't happen, but on our last full day in the field at Tumbleweed Road, we found this lovely Texas Horned Lizard (*Phrynosoma cornutum*) (Fig. 54). An excellent finish to our time together!

It was the morning of August 3 and we parted ways. Brian headed back toward Iowa to visit family and James headed for home in Georgia. James had one more stop just north of Little Rock in Arkansas and picked up one more interesting specimen of an undescribed *Virbia* (Fig. 55). What a nice way to cap off one of the best mothing trips ever!!

Plate 1. Various "Microlepidoptera from the Red Hills region, Barber Co., Kansas (see Table 1 for more information on each species). All rows left to right. Top Row: *Amydria curvistrigella, Ethmia burnsella, E. mirusella, Aproaerema nigrella*. Second Row: *Dichomeris isa, Aristotelia pudibundella, Filatima albilorella, Eucosma pallidicostana*. Third Row: *Pelochrista canana, Epiblema benignata, Gretchena amatana, Pococera humerella*. Fourth Row: *Pococera baptisiella, P. euphemella, Salebriaria roseopunctella, Meroptera cviatella*. Fifth Row: *Sciota subfuscella, S. rubrisparsella, Anderida sonorella, Prionapteryx indentellus*. Bottom Row: *Fissicrambus hemiochrellus, Abegesta reluctalis, Mecyna submedialis, Mimorista trimaculalis*.

Figs. 52-56. Fig. 52. Google Earth view of the pull off to the north four miles west of Medicine Lodge, productive but very different habitat than the Tumbleweed Road habitat 11 miles further west. This is near the spot labelled "Mingona" in Fig. 47. **Fig. 53.** Bait trap at the oil pump location, filled with hundreds of Goatweed Butterflies (*Anaea andria*) and some other butterflies. **Fig. 54.** Texas Horned Lizard (*Phrynosoma cornutum*) at the Tumbleweed Road location, August 2, 2023. **Fig. 55.** A specimen of an undescribed *Virbia* species from just north of Little Rock, Arkansas. **Fig. 56.** A selection of the *Anaea andria* from the bait trap in Fig. 53. The left two columns are males (though the lower left specimen is odd), the right two columns are females, showing some of the significant variability in patterning. The two undersides (both female) also show variability in the rusty vs. gray coloring.


52


53


54

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The Marketplace

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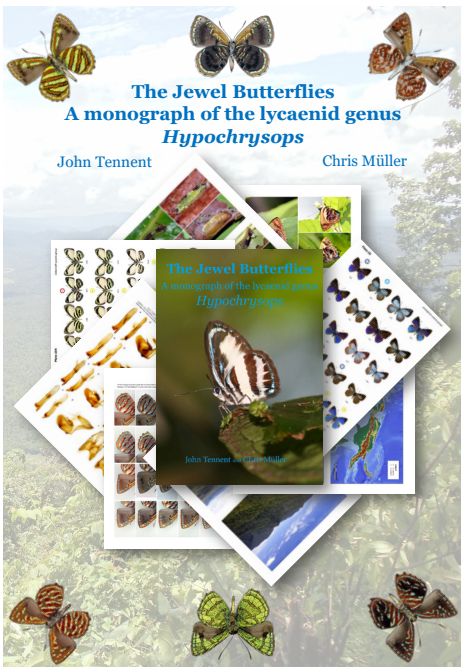
New Book Available. The Jewel Butterflies: A monograph of the lycaenid genus *Hypochrysops*, by John Tennant and Chris Müller.



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.

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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.**

Membership Updates

Chris Grinter

Includes ALL CHANGES received by May 14, 2025. 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*)

Rick E. Borchelt: 4602 Drexel Rd., College Park, MD 20740 (rborchelt@gmail.com)
Pari Collins: [red. by req.] (pcollins22@georgefox.edu)
Shawn Hunter: PO Box 941, Gentry, AR 72734 (CitizenScienceNWA@gmail.com)
Jacob L. Hoopes: [red. by req.] (jlhoopes123@gmail.com)
Paul M. McKenzie: 2311 Grandview Circle, Columbia, MO 65203 (paulbeckymo@mchsi.com)
Jo Nagai: 1-6-3, Ibukidai Higashimachi, Nishi-ku, Kobe-shi, Hyogo prefecture 651-2242 JAPAN (minisae.3474@gmail.com)
Kenneth Raygor: 9201 Bradner Drive, Austin, TX 78748 (kraygor7@gmail.com)
Rose D. Swift: 1753 Woodleaf Cir., Roseville, CA 95747 (swift@napavalleyexpo.com)

Address Changes: *All U.S.A. unless otherwise noted.*

Ronald R. Nelson: 2847 S 9th St., Milwaukee, WI 53215 (sphinxnelson@aol.com)

Moco Moco habitat. This broad-leafed shrub/tree (Moco Moco) shown here is the foodplant for *Helicopis gnidus* and *H. cupido*. This image was taken along the Putumayo River at Playa Rica (300m) Putumayo Department, Colombia in the Sendaro Arbol Que Camina, Feb. 4-5, 2025. Image by Bill Berthet. See the related article on pg. 90.

Updates to Maine butterfly list, Calhoun, Lit. Cited, continued

Continued from pg. 97

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Pohl, G.R., and S.R. Nanz (eds.). 2023. Annotated taxonomic checklist of the Lepidoptera of North America, north of Mexico. Wedge Entomol. Res. Fdn., Bakersfield, California. xiv +580 pp.

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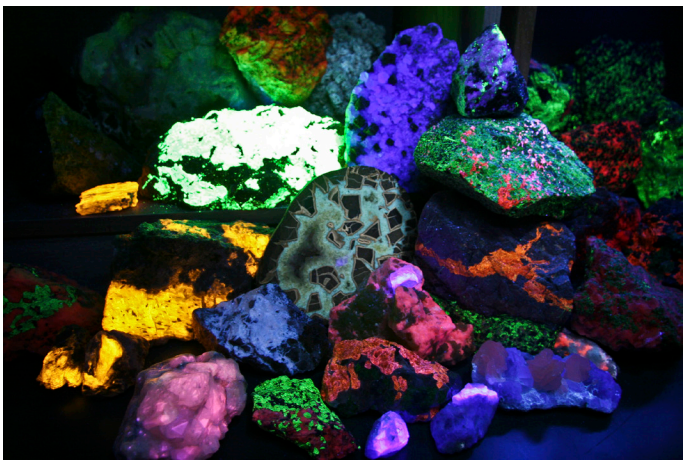

A display of Eric Quinter's fluorescent mineral specimens, glowing under UV illumination. See related obituary on page 110.

Digital Collecting:

When plan B works better than plan A: hangin' with *Helicopis* at Playa Rica, Putumayo Department, Colombia

Bill Berthet

12885 Julington Road, Jacksonville, FL 32258 **bergems@comcast.net**

Originally this trip was planned as a 10 night stay from January 27 to February 5, 2025. I headed back to R.N. La Isla Escondida near Orito, Colombia (850m) for photographing butterflies and other goodies. My stay there last September was very productive (See News of Lep Soc, Vol. 67 Number 1), and I was looking forward to visiting the Orange Trail again. For others interested in the area, here is the contact information: R.N. La Isla Escondida: **www.la-isla-escondida.com**, with Jurgen's updated contact at WhatsApp +57 305-390.88.76.

Drinking water comes from a nearby creek. Jurgen has installed 2 additional filters that not only filter the water, but also mix it with ozone, making the water safe to drink. Initially, there was a cold front that came through, giving us cloudy conditions with intermittent rain, sometimes heavy at night, providing only a few opportunities for brief full sun, usually in late afternoon.

Early morning on the second day we were excited to see the seldom observed *Copiopteryx semiramis*. After pictures we all watched it slowly flying back into the rain forest.

Copiopteryx semiramis

Aspitha aspitha rufescens

That afternoon I observed another genus and species I had not photographed before -- *Aspitha a. rufescens*.

After 6 days hoping for sun, we changed to plan B. We took a cab to the Hotel Vasu in Puerto Asis, staying there for the next 4 nights, hoping for sunnier weather. Thankfully, we got sunny mornings on February 4-5, 2025. We met Juan, who took us in his longboat downstream for about 20 minutes on the Putumayo River to Playa Rica (300m) Putumayo Department, Colombia to Sendaro Arbol Que Camina. The afternoon temperature climbed up to 40C – 104F, with humidity at 94.50%. Quite a change!

We explored a grove with variable tree coverage, which included Moco Moco (*Montricardia arborascens*), the broad leafed host plant for *Helicopis gnidus* and *Helicopis cupido*. (see also previous page). When disturbed, these riodinids can be found fluttering at a leisurely to brisk pace usually landing under the leaf of its host plant or a *Heliconia* sp.

Map of Puerto Asis/Playa Rica area

Moco Moco habitat; the broad-leafed plant on the left is the Moco Moco.

The habitat in the area is freshwater seasonally flooded lagoons, filled with mosquitos, large spiders, wickedly spiny thickets and dense vegetation, not to mention bullet ants! And careful how you step: in some moist areas your boot can get sucked in by the mud, almost to the top. Use socks that snuggly fit your feet inside the boots. I use Tingley boots -- they are lightweight and durable.

For two days I spent around 3 1/2 hours observing: 1x in the morning 1 day, 1x in the afternoon 1 day, and 1x from 3:30-4:30 p.m. both days. When disturbed the three *H. gnidus* I observed would fly up to one of the highest overhanging Moco Moco leaves to perch under. I observed no wing sawing like some hairstreaks, though I have observed images of *H. gnidus* wing sawing from other photographer's images. I also did not observe open wing displays even while moving. When perched under the leaves of Moco Moco 3-4m high, *H. gnidus* put up with me underneath them photographing with flash. This species seems to prefer a closed canopy.

I observed 9+ *H. cupido* perched under lower leafs of Moco Moco. When they were disturbed, they would fly several feet away landing around the same height as before, while others would fly back into the lagoon, or fly to higher Moco Moco leaves to perch under. This species would commonly display open hind wings, particularly while walking under the leaf. No wing sawing was observed. This species seems to prefer lower dense thickets near a trail, with *Heliconia* sp. in wetter areas.

The first day when *H. cupido* was first disturbed they would usually flutter less than 5 feet before perching under another leaf about 1-2m high. The second day when disturbed they would usually fly back into the wetter areas of the lagoon. Both days around 3-5 pm *H. cupido* would come out of the marshy area and bask under a leaf or perch on an unfurled leaf along the trail.

Indiana Cristobol (Lepidoptera Colombiana) was able to observe (see his M-F image, below) that both males and females of *H. cupido* were in greater proportion in this area with respect to *H. gnidus*. Both males and females perform nuptial flights that result in copulations in the upper leaves of the Moco Moco plants. Another additional thing is that these butterflies are more active when the ambient temperature exceeded 26 degrees Celsius. Below this temperature they are not very active or visible. Finally, these butterflies prefer to use their host plant to perch and find a mate, but they can also be in lower strata of vegetation up to 50 cm from the ground on leaves of *Heliconia* sp. where they seek refuge. Plan B worked better than plan A! (see also front cover).

Left column: *Helicopis cupido*. Upper right: *Helicopis gnidus*. Lower left: *Helicopis cupido* mating, House of Colors trail, Jan. 18, 2025, Puerto Asis. Image by Indiana Cristo.

Annotated update to the list of Maine butterflies

John V. Calhoun

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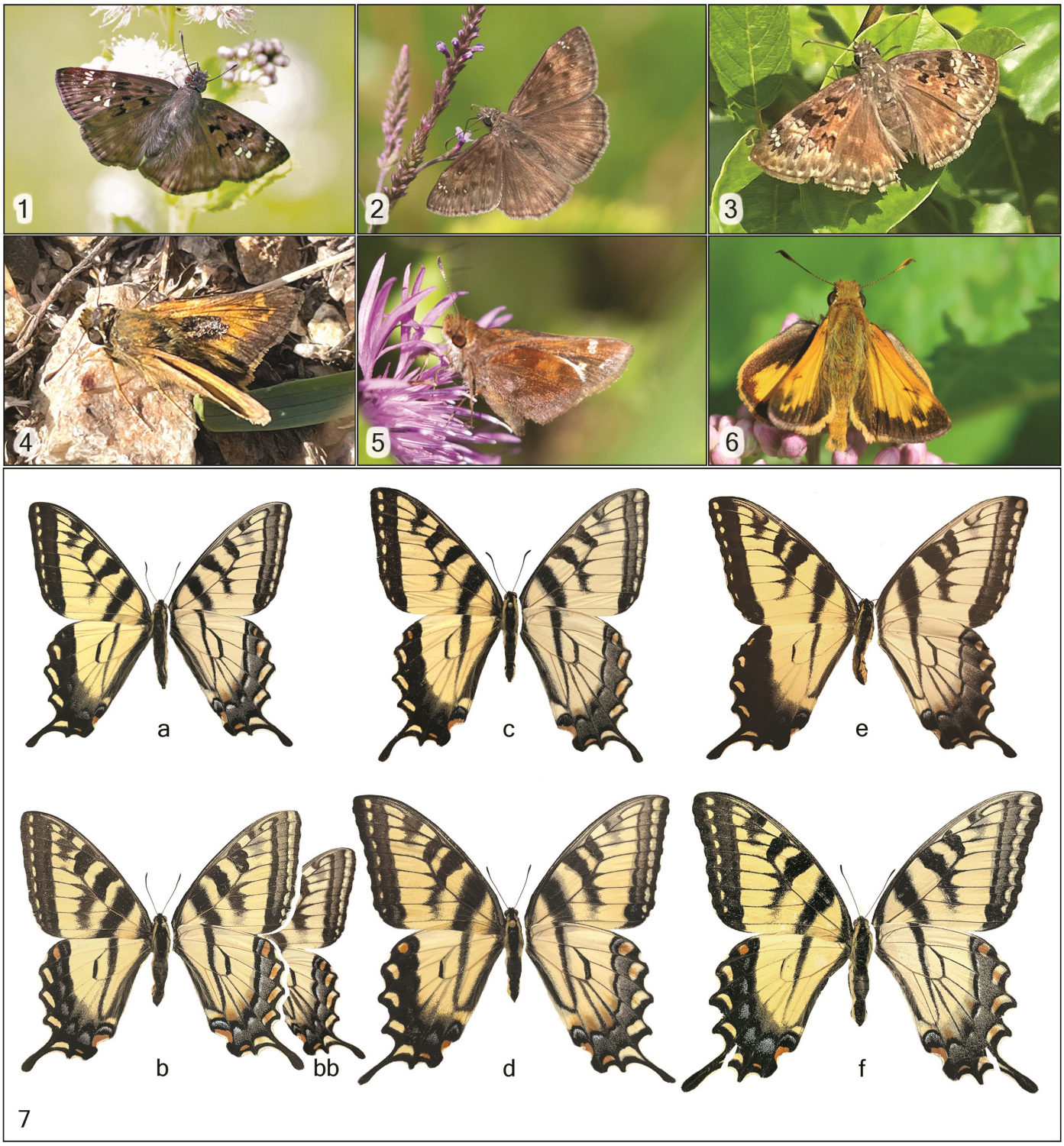
Faunal books are quickly outdated, sometimes even before they are published. A number of recent taxonomic revisions affect the names of butterfly species occurring in Maine, most of which were proposed while the book *Butterflies of Maine and Canadian Maritime Provinces* (deMaynadier et al. 2023) was in press. In addition, three species were recorded in Maine for the first time just before or shortly after publication of this book. The Zabulon skipper, *Lon zabulon* (Boisduval & Le Conte), now appears to be a breeding resident of Maine. Horace's duskywing, *Erynnis horatius* (Scudder & Burgess), is evidently an irregular colonist capable of producing at least one generation per year. The Huron skipper, *Atalopedes huron* (W.H. Edwards), is a late-season immigrant with the potential to be a rare colonist. All three of these species were listed by deMaynadier et al. (2023) as possibly occurring in Maine, and their arrival is likely due to a continuing northward shift in their ranges due to climate change (Breed and Stichter 2012). A fourth species, the recently-described midsummer tiger swallowtail, *Pterourus solstitius* (DeRoller, Wang, Dupuis & Schmidt), is regarded as a rare resident of Maine pending further study. deMaynadier et al. (2023) speculated that most records of the eastern tiger swallowtail, *Pterourus glaucus* (L.), in Maine are probably referable to *solstitius*. With these four additions, the Maine state butterfly list currently totals 123 species.

List updates. The nomenclature of *Butterflies of Maine and Canadian Maritime Provinces* (deMaynadier et al. 2023) primarily follows Pelham (2022), which was updated by Pelham (2023). Although the checklist of North American Lepidoptera by Pohl and Nanz (2023) was published after Pelham (2023), its butterfly section reflects the treatment of Pelham (2022), which does not incorporate recent genetic research. Mostly in accordance with Warren et al. (2024), I propose 15 changes to the list of Maine butterflies as presented in deMaynadier et al. (2023). Additional taxonomic revisions may be proposed before this update is published.

For taxonomic changes in the following list, the updated Latin name is given, followed in brackets by the Latin and common names as they appear in deMaynadier et al. (2023). iNaturalist (2025) employs common names for many subspecies of butterflies, but I do not support their adoption. Multiple common names for the same species results in unnecessary confusion, and I mention them merely for reference.

1. ***Thorybes pylades* (Scudder)** [*Thorybes pylades pylades*, Northern Cloudywing]. Zhang et al. (2023) elevated subspecies of *pylades* to full species, leaving no recognized subspecies within this species group.
2. ***Erynnis horatius* (Scudder & Burgess), Horace's Duskywing.** NEW ADDITION. Daniel Taylor photographed a fresh female on 6 August 2023 at Denmark, York Co. (Fig. 1). In 2024, this species was recorded at many additional localities in Maine (iNaturalist): Cumberland Co. – South Portland (female, 28 July, J. Jacobs); Lincoln Co. – Boothbay (male, 22 July, B. Bristol); York Co. – Berwick (male and female, 27 July, D. Nelson, Fig. 2; male, 10 August, D. Nelson), Eliot (two males and five females, 26-27 July, J. Calhoun, Fig. 3; male, 30 July, H. Wilson), Kennebunk (male, 13 July, J. Stauffer), Mt. Agamenticus (female, 20 July, J. Nathan), Sanford (female, 6 August, D. Nelson), and York (female, 7 August, M. Akresh). Eight individuals were observed at the Eliot locality between 26 and 30 July. At least one brood was probably produced there in 2024, and I observed a female flying around sapling northern red oaks (*Quercus rubra*), which probably served as a local food plant. This species likely occurred in southern Maine prior to 2023, but it was overlooked. Records posted on iNaturalist indicate that this species also experienced an upsurge in southern New Hampshire in 2024, particularly in coastal counties.
3. ***Erynnis brizo* (Boisduval & Le Conte)** [*Erynnis brizo brizo*, Sleepy Duskywing]. Burns (2020) concluded that all subspecies of *brizo* are discrete species, leaving *brizo* without subspecies.
4. ***Polites coras coras* (Cramer)** [*Polites peckius peckius* (W. Kirby), Peck's Skipper]. The name of this species has shifted between *coras* and *peckius* for seven decades. After closely examining the published description and accompanying figure of *coras*, as well as the original drawing used for the figure, Zhang et al. (2022) concluded that the name *coras* has priority. I reached this same conclusion in 2009 after examining the original drawing for the published figure of *coras*. The nominotypical subspecies is applicable to populations in Maine.
5. ***Vernia verna verna* (W.H. Edwards)** [*Vernia verna*, Little Glassywing]. Zhang et al. (2023) determined that the more western subspecies *V. v. sequoyah* (H. Freeman) is valid, despite it having been synonymized by Miller and Brown (1981). This reestablished the



Figs. 1-7. Maine state butterfly records and tiger swallowtails. **1,** *Erynnis horatius* female, 6.viii.2023, Denmark, Oxford Co. (D. Taylor). **2,** *E. horatius* male, 27.vii.2024, Berwick, York Co. (D. Nelson). **3,** *E. horatius* female, 27.vii.2024, Eliot, York Co. (J. Calhoun). **4,** *Atalopedes huron* male, 24.ix.2024, Eliot, York Co. (J. Calhoun). **5,** *Lon zabulon* female, 23.viii.2023, Eliot, York Co. (H. Wilson). **6**, *L. zabulon* male, 10.viii.2024, Berwick, York Co. (D. Nelson). **7.** Examples of tiger swallowtails from Maine, dorsal (left) and ventral. Sizes are proportional (all leg. J. Calhoun unless noted). **a,** *Pterourus canadensis* male, 10.vi.2019, Sidney, Kennebec Co. **b,** *P. canadensis* female, 2.vii.2019, Sidney, Kennebeck Co. **bb,** small female, 12.vi.2018, Magalloway Plt., Oxford Co. **c,** *Pterourus solstitius* male, 21.vii.2015, Eliot, York Co. **d,** *P. solstitius* female, 28.vii.2024, Eliot, York Co. **e,** presumed *Pterourus glaucus* male, 2.ix.1931, Rangeley, Franklin Co. (leg. C. dos Passos, AMNH). **f,** possible *P. glaucus* female, 28.vi.2024, Eliot, York Co.

nominotypical subspecies, which is applicable to populations in Maine.

6. ***Atalopedes huron* (W.H. Edwards), Huron Skipper.** NEW ADDITION. I photographed and captured two individuals at Eliot, York Co.: a male on 24 September 2024 (Fig. 4), and a female on 27 September. Originally described as *Pamphila huron* in 1863, this taxon was treated as a subspecies of *Atalopedes campestris* (Boisduval) for over four decades. Based on genetic analyses, Zhang et al. (2022) determined that *huron* represents a more eastern species in North America, distinct from western *campestris*. A warming climate is undoubtedly prompting a northward expansion of *A. huron* in New England, just as *campestris* is expanding in western North America (Crozier 2003). iNaturalist uses the awkward common name "Huron Sachem" for this species, but Huron Skipper is more fitting, as it was frequently used when the butterfly was known as *P. huron* (e.g., Maynard 1891, Beutenmüller 1902). Warren et al. (2024) use the traditional name "Sachem" for *A. huron*, while proposing the name "Casachem" for *A. campestris* (presumably a portmanteau of California sachem in reference to this species' California type locality).

   2024 was an unusually productive for rare immigrant skippers in southern Maine. In addition to the first *A. huron* in Maine at Eliot, York County, I recorded at this same locality a male *Panoquina ocola* (W. H. Edwards) on 22 September, and five (two males, three females) *Hylephila phyleus* (Drury) between 24 September and 5 October. Two male *phyleus* were also photographed by H. Wilson at this locality on 30 September. In addition, three *ocola* and five *phyleus* were observed elsewhere in York County in late 2024 (iNaturalist), including a single male *phyleus* that I captured in South Berwick on 27 September. Prior to 2024, only five records each of *ocola* and *phyleus* were documented in Maine, between 2012 and 2023 (Gobeil and Gobeil 2020, iNaturalist 2025, Maine Butterfly Survey database). These two species, as well as *A. huron*, were recorded at several localities in southern New Hampshire in 2024 (iNaturalist), and a few *phyleus* were still being observed in coastal New Hampshire in early November (Mirick 2024b).

7. ***Lon zabulon* (Boisduval & Le Conte), Zabulon Skipper.** NEW ADDITION. Herb Wilson observed three males, and photographed a female on 23 August 2023 at Eliot, York Co. (Fig. 5). There were at least eleven records of this species in Maine in 2024, all in York Co.: Berwick (male, 10 August, D. Nelson, Fig. 6), Eliot (ten males and four females, 1-13 June, J. Calhoun), Kittery (male, 10 June, J. Calhoun; male, 27 August, M. Ingham; two males and one female, 1 September, D. Nelson), Kittery – Isles of Shoals (female, 1 September, P. Ackerson), Old Orchard Beach (male, 11 September, C. Streett), and York (female, 18 August, D. Nelson). Not historically known to occur in New England, *zabulon* is currently a widespread breeding resident in Connecticut, Massachusetts, and Rhode Island (O'Donnell et al. 2007, MBC 2025, Pavulaan 2024b). It was first recorded in New Hampshire in 2020, when two individuals were found near the Massachusetts border. In 2022, the species was recorded from 17 locations in three counties of southeastern New Hampshire (Mirick 2022). Considered to be an indicator species for climate change, *zabulon* continues to spread northward and inland in New Hampshire, where it was one of the most common butterfly species at a coastal locality in August 2024 (Bauer 2024, Mirick 2024a). In Massachusetts, the recent increase in abundance of *zabulon* may be accompanied by a decline of its congener, *Lon hobomok* (T. Harris) (Fairbrother 2022). *Lon zabulon* probably became established in Maine in 2022, and it is expected to continue expanding its range in the state.

8. ***Panoquina ocola* (W.H. Edwards)** [*Panoquina ocola ocola*, Ocola Skipper]. Zhang et al. (2022) transferred the subspecies *P. o. distipuncta* K. Johnson and Matusik to the species *Panoquina lucas* (Fabricius), leaving *P. ocola* without subspecies.

9. ***Pterourus solstitius* (DeRoller, Wang, Dupuis, and Schmidt). Midsummer Tiger Swallowtail.** NEW ADDITION. Butterflies that agree with the concept of this newly described species occur in southern Maine. In their original description, DeRoller et al. (2025) include two map points for this species in southern Maine, and their supplementary data indicates that they are based on photos of adults posted on iNaturalist from Androscoggin County (2023) and Cumberland County (2024). Most other known records that can be attributed to this species, including a series in my own collection dating from 2011—2024, are from York County. Specimens and photographs of tiger swallowtails from southern Maine, particularly those recorded in July and August, should be reexamined. See the supplementary discussion below for more information on tiger swallowtails in Maine.

10. ***Colias philodice philodice* Godart** [*Colias philodice*, Clouded Sulphur]. Although Pelham (2022, 2023) and Pelham and Pohl (2023b) do not recognize subspecies of *C. philodice*, other authors (e.g., Lamas 2004, Warren et al. 2024) recognize the Neotropical subspecies *C. p. guatemalena* Röber. As such, Maine populations are applicable to the nominotypical subspecies.

11. ***Lycaena hypophlaeas hypophlaeas* (Boisduval)** [*Lycaena phlaeus hypophlaeas*, American Copper]. This species was originally described as *Polyammatus hypophlaeas* in 1852, but it was subsequently treated as a subspecies of *Lycaena phlaeas* (L.). Zhang et al. (2022) determined that *L. phlaeas* is a distinct Eurasian species, thus the name *hypophlaeas* was returned to the North American butterfly. Populations in Maine are applicable to the nominotypical subspecies, which is called the "Eastern American Copper" on iNaturalist.

12. ***Cupido comyntas orientalis* Grishin** [*Cupido comyntas comyntas* (Godart), Eastern Tailed-Blue]. Zhang et al. (2024) determined that the type locality of the nominotypical subspecies (*C. c. comyntas*) is likely in California, and that western North American populations are distinct from those in the East. Grishin (2024) proposed the subspecies name *orientalis* for eastern populations.
13. ***Cupido amyntula albrighti* (Clench)** [*Cupido amyntula marítima* (Leblanc), Western Tailed-Blue]. Calhoun (2022, 2024) concluded that the subspecies *C. a. maritima* is not morphologically supported, and the name *maritima* is a *nomen nudum* (unavailable name). As a result, populations in Maine should tentatively be recognized as *C. a. albrighti*. iNaturalist uses the common name "Albright's Tailed-Blue" for this subspecies.
14. ***Boloria myrina myrina* (Cramer) and *Boloria myrina atrocostalis* (Huard)** [*Boloria selene myrina* and *Boloria selene atrocostalis*, Silver-bordered Fritillary]. This species was originally described as *Papilio myrina* in 1777, but it was subsequently treated by most authors as a subspecies of *Boloria selene* ([Denis & Schiffermüller]). Confirming previous conclusions, Zhang et al. (2022) determined that *selene* is strictly a Eurasian species, thereby restoring the name *myrina* to North American populations. iNaturalist uses the common name "Myrina Fritillary" for *B. m. myrina*, and "Dark-bordered Fritillary" for *B. m. atrocostalis*. Although the name silver-bordered fritillary has been used for the North American butterfly for over 140 years, iNaturalist limits its usage to observations that do not specify a subspecies, curiously amending it to "American Silver-bordered Fritillary," though butterflies known as the silver-bordered fritillary only occur in North America.
15. ***Junonia coenia* Hübner** [*Junonia coenia coenia*, Common Buckeye]. Lalonde and Marcus (2018) and Cong et al (2020) elevated the subspecies *J. c. grisea* Austin & J. Emmel to full species, removing subspecies from *J. coenia*.

Controversial revisions. Several changes to genera of Hesperiidae that were proposed by Zhang et al. (2019) were not recognized by deMaynadier et al. (2023) in accordance with Pelham (2022), which formed the basis for Pelham and Pohl (2023a). Pelham (2023) continues to follow this treatment, though the changes are acknowledged by Warren et al. (2024). In these instances, I chose to follow popular usage, and I list them here in the event that they become more widely accepted for the following species in Maine. The proposed Latin combination is given, followed in brackets by the combination and common name as they appear in deMaynadier et al. (2023).

1. *Cecropterus bathyllus* (J.E. Smith) [*Thorybes bathyllus*, Southern Cloudywing]. Warren et al. (2024) admit that the familiar genus name *Thorybes* may be more desirable, but they argue that it is best treated as a subgenus of *Cecropterus* for both nomenclatural and taxonomic reasons.
2. *Cecropterus pylades* (Scudder) [*Thorybes pylades pylades*, Northern Cloudywing]. See above regarding the use of the genus *Cecropterus* over *Thorybes*.
3. *Gesta juvenalis juvenalis* (Fabricius) [*Erynnis juvenalis juvenalis*, Juvenal's Duskywing]. Although Warren et al. (2024) currently place most New World duskywings in the genus *Gesta*, those authors also perceive value in retaining the genus *Erynnis*. iNaturalist uses the common name "Northern Juvenal's Duskywing" for this subspecies.
4. *Gesta horatius* (Scudder & Burgess) [*Erynnis horatius*, Horace's Duskywing]. See above regarding the use of the genus *Gesta* over *Erynnis*.
5. *Gesta baptisiae* (W. Forbes) [*Erynnis baptisiae*, Wild Indigo Duskywing]. See above regarding the use of the genus *Gesta* over *Erynnis*.
6. *Limochores mystic mystic* (W.H. Edwards) [*Polites mystic mystic* (W.H. Edwards), Long Dash]. Although Warren et al. (2024) currently use the genus *Limochores* for this and other species that were traditionally included in the genus *Polites*, they confess that this opinion is debatable.
7. *Limochores origenes origenes* (Fabricius) [*Polites origenes orígenes*, Crossline Skipper]. See above regarding the use of the genus *Limochores* over *Polites*. iNaturalist uses the common name "Eastern Crossline Skipper" for this subspecies.

Tiger Swallowtails in Maine. As discussed in deMaynadier et al. (2023), two species of tiger swallowtails were historically thought to occur in Maine, *Pterourus glaucus* (L.) (Eastern Tiger Swallowtail) and *Pterourus canadensis* (Rothschild and Jordan). The morphological expression of these taxa is influenced by latitude, elevation, coastal and mountain weather impacts, variable seasonal timing, and genetic introgression. Maine is approximately 320 miles (515 km) long, spanning four degrees of latitude (43°- 47°), and encompasses 31,000 square miles (80,000 sq. km) of land area. It has nearly 230 miles (370 km) of coastline, and mountainous terrain dominates much of the northwestern portion of the state, with 14 peaks over 4000 ft. (1219 m). Microclimates result in variation in wing morphology and seasonal phenology, which can lead to misconceptions about the number of tiger swallowtail species present. Their identification can be difficult, especially southward, where a third taxon is now known to occur. Examples of Maine tiger swallowtails are illustrated in Figure 7.

The most common and widespread member of this group in Maine is *P. canadensis* (Fig. 7a, b), which occurs statewide. It is extremely variable in size and wing pattern. Some, particularly those found at higher elevations, can be quite small with reduced dark markings (Fig. 7bb). Adults mostly fly from late May to mid-July, depending on

latitude and elevation, with a few worn females persisting into early August. Some late dates of *canadensis* in the Maine Butterfly Survey database are in error, including the extreme date of 17 September reported by deMaynadier et al. (2023), which actually refers to a larva. Others were identified when butterflies with *canadensis*-like features were automatically assigned to that species, regardless of their recorded date.

Some butterflies found in Maine appear to agree with *P. glaucus* (Figs. 7e, f), but it is unclear if "pure" *glaucus* occurs in the state (deMaynadier et al. 2023). Although the dark form of female *glaucus* has not been confirmed in Maine, Wright (2020) claims to have seen a few in Oxford County in the western part of the state. Unfortunately, there are no specimens or photographs to support these observations (S. Wright pers. comm.). A female with intermediate dark coloration was reportedly photographed in July 2016 in Rockingham County, New Hampshire, just south of York County, Maine (iNaturalist).

Records of "intermediate" tiger swallowtails, possessing characters of both *P. glaucus* and *P. canadensis*, have been reported from southern Maine for many years. Some participants of online discussion groups referred to them as "*appalachiensis* type II," implying kinship with the Appalachian tiger swallowtail, *Pterourus appalachiensis* Pavulaan and D. Wright. These butterflies were more recently identified on iNaturalist as "*canadensis* x *glaucus*." Usually encountered singly or in small numbers in Maine, these "intermediate" tiger swallowtails (Figs. 7c, d) are found from late June to mid-August, with a peak flight in mid to late July. The later flight period and morphological characters of these butterflies are consistent with the recently-described midsummer tiger swallowtail, *P. solstitius*. Preliminary research suggests that this species is distributed at least from south-central Ontario, south to northern Pennsylvania, and east to northern and central New York, Vermont, New Hampshire and southern Maine (DeRoller et al. 2025). The range of *solstitius* is probably more extensive, as butterflies resembling this species have been reported in central Maine, and along the coast as far northeast as southern New Brunswick (iNaturalist). Pavulaan (2024a) identifies butterflies in southern New England as *solstitius*. Unfortunately, so-called records of *P. solstitius* on iNaturalist must be viewed with caution, as an ill-conceived "taxon split" recently converted nearly all identifications of "*canadensis* x *glaucus*" to *solstitius*, with no regard for date or locality. As a result, a large number of so-called *solstitius* observations on iNaturalist are not applicable to that species.

Further complicating matters, the ranges of *P. canadensis* and *P. glaucus* converge near the southern tip of Maine, and the interaction of three closely related taxa likely explains the confusing phenotypes sometimes encountered in the southern portion of the state. This includes a large, damaged female that I captured on 28 June 2024 in southern York County (Fig. 7f), at a locality where *P. solstitius* is known to occur in July and August. This striking female closely resembles *glaucus* as defined by DeRoller et al. (2025). It may be a stray *glaucus* from farther south, or it is an odd, hybrid phenotype of local origin. Even more perplexing is a worn female that I captured at another locality in York County on 27 September 2024, which is later than any other confirmed records of tiger swallowtails in Maine. The size of *canadensis*, this striking female resembles an amalgamation of taxa (Fig. 8).

Fig. 8. Puzzling female tiger swallowtail from Maine, 27.ix.2024, South Berwick, York Co. (leg. J. Calhoun).

Yet another tiger swallowtail species was recently recognized in the Northeast, though its status requires further study. The New England tiger swallowtail, *Pterourus bjorkae*, was described by Pavulaan (2024a), with additional information and images presented in Pavulaan (2024c, 2024d). This taxon reportedly flies from late April to early July in southern New England, and perhaps beyond. It is not known to occur in Maine, though more research is needed to understand the tiger swallowtails in northern New England.

Possible species. Fifteen additional butterfly species are listed by deMaynadier et al. (2023) as having a reasonable chance of being recorded in Maine. The most likely to be encountered in the near future are the red-banded hairstreak, *Calycopis cecrops* (Fabricius), and the introduced European common blue, *Polyommatus i. icarus* (Rottemburg). First recorded in Massachusetts in 2011 (Stichter 2015), *C. cecrops* continues to expand northward. It was first found in New Hampshire in 2023, and there were at least 18 observations of this butterfly in coastal New Hampshire in August and September 2024. One island record is only 0.16 mi (0.26 km) from the Maine border (eButterfly, iNaturalist). The first documented records of

P. icarus in North America were in 2005, near Montreal, Quebec. Based on published sources and iNaturalist observations, this species reached Ontario by 2013, Vermont by 2020, and New York by 2021. Still expanding, it is now established around Toronto, Ontario, with over 2,000 iNaturalist observations from that area since 2019. This species was recorded several times in August and September 2024 at Saint-Georges, Quebec (iNaturalist), about 17 miles (27 km) west of Maine. It was also recorded at Halifax, Nova Scotia in 2024 (iNaturalist), representing the first known record of this species in the Maritimes region of Canada.

Additional citation for the region. While deMaynadier et al. (2023) was in press, I came across a relevant publication that we had overlooked due to its limited availability, especially in the US. The book *Papilllons et chenilles du Québec et des Maritimes* (*Butterflies and Caterpillars of Quebec and the Maritimes*) (Leboeuf and Le Tirant 2012) contains general information on the butterflies of the region, including Maine. It is written in French, though English common names are included. Part of a series of nature guides, the book is nicely designed and includes images of adult butterflies and caterpillars. It is another valuable reference to anyone interested in the butterflies of northeastern North America.

Acknowledgements. For kindly providing information and granting permission to reproduce images, I thank Charles DeRoller, Suzanne Rab Green (American Museum of Natural History; AMNH), Nick Grishin, Jamien Jacobs, Shinichi Nakahara, Judd Nathan, David Nelson, Harry Pavulaan, Daniel Taylor, Herb Wilson, David Wright, and Sara Wright.

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Euchaetes helena (Erebidae: Arctiinae) life history notes

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The junior author found caterpillars on Plateau Rocktrumpet, *Mandevilla lanuginosa* (M. Martens & Galeotti) Pichon, August 3, 2024. She collected several of these, and delivered to the senior author a pupa and 3 larvae. Adults issuing from this collection were determined to be *Euchaetes helena* (Cassino, 1928).

Two months later, in October, more caterpillars were found on the same plant and 3 were collected and reared by the senior author. A male and a female eclosed on the same day, so the decision was made to leave them in a large popup tent in hopes they would mate. Although no mating was observed, after 2 days the female was confined to a 50-dram vial with a dried leaf of the hostplant. Overnight, she placed eggs on the leaf and on the sides of the vial. The eggs appeared to have been deposited in rows. They proved to be fertile, and so it was possible to document all stages of the moth's development.

Description of the immature stages

Ova (Fig. 1): Yellow, hemispherical, with very faint dimpling over surface. Ova and nearby substrate sprinkled with scales from female, despite adult's lack of abdominal tuft.

First instar (Fig. 2): Body tan. Exaggerated setal bumps with brown pinacula. Head and venter dark brown or black. Dorsal setae primarily dark, long, sparse; interspersed with very few short setae. Thoracic setae longer than abdominal with longest on T3; abdominal uniform A1-5 then increasing in length to longest on A7.

Second instar (Fig. 3): Body light brown with white addorsal and subspiracular stripes. Setal bumps on T3 and A7 enlarged and darkened.

Third instar (Fig. 4): Body noticeably humped at T3; middorsal setal bumps darker to give appearance of dorsal stripe. Dorsal setae thicker, fanning out but rising primarily upward. Subdorsal setae spread out closer to body.

Fourth instar (Fig. 5): Head reddish brown. Most pinacula now surrounded by white ring. Some shorter dorsal setae on thoracic segments dark grey; remainder primarily off-white.

Figures 1-6: Early immature stages of *Euchaetes helena*. **1.** Egg clutch; **2.** first instar; **3.** second instar; **4.** third instar; **5.** fourth instar; **6** fifth instar.

Figures 7-11: Late immature stages of *Euchaetes helena*. **7.** sixth instar on first day of stage; **8.** sixth instar on second day of stage; **9.** pupa; **10.** seventh (ultimate) instar with full set of setae; **11.** seventh (ultimate) instar with few setae.

Fifth instar (Fig. 6): Dorsal setal bumps A7-9 very dark. Longest setae (T1, T3) still off-white. Shorter setae along dorsum of thoracic and anterior three abdominal segments dark grey-black; on remainder of dorsum mixed white and grey.

Sixth instar (Figs. 7-8): Virtually all setae white on first day of instar; for remainder of instar, lower third of shorter dorsal setae yellow. Long vertical tuft of setae on T3; most setae in front of this segment curling over head of caterpillar. A few long setae on anterior, especially A7.

Seventh instar (Figs. 10-11): Head variable, either very dark brown or reddish brown above darkening. Middorsal setae black, in thick tufts. Addorsal setae in smaller tufts; white with lower third yellow. Only a sprinkling of longer white setae on T3 and at anterior.

Cocoon (Fig. 9): thin-walled with setae woven into wall as is typical of arctiids. The pupa was not visible for inspection.

Discussion

The change of setal color in the penultimate instar was noteworthy. The transformation was observed in a caterpillar isolated in a 20-dram vial, verifying there was no molt causing the color change. In the ultimate instar, several individuals, both wild-caught and captive-reared, lost most of their setae and yet continued feeding for several days (Fig. 11). The caterpillars fed primarily on mature leaves.

Range

Most sightings of *E. helena* reported on iNaturalist.org range from the hill country of Texas west to the Davis Mountains. Figure 12 shows these sightings (red squares) superimposed over the range of native *Mandevilla* species (green counties) as given by the USDA PLANTS Database. A blue circle indicates the site of the collections from Mission, TX, and the green circle represents 2 individuals reported by Nagle and Schmidt (2018), who confirmed the identifications by DNA analysis.

Given the nearest Texas sightings were some 260 or so miles from Mission, TX, it was somewhat surprising to find two successive generations of *E. helena* breeding in the lower Rio Grande Valley. Since the West Texas population correlates strongly to the host plant distribution, it seems likely the moth is present throughout the region of Mexico where *Mandevilla* grows, which would include the four Mexican states bordering Texas (Flora of North America Editorial Committee, 1993+). It is possible that the moth is not attracted strongly to lights, and therefore somewhat overlooked: blacklighting events are held on a regular basis on the Welliver property, and were held during the time when adults might have been flying in the area, but none have ever been observed there.

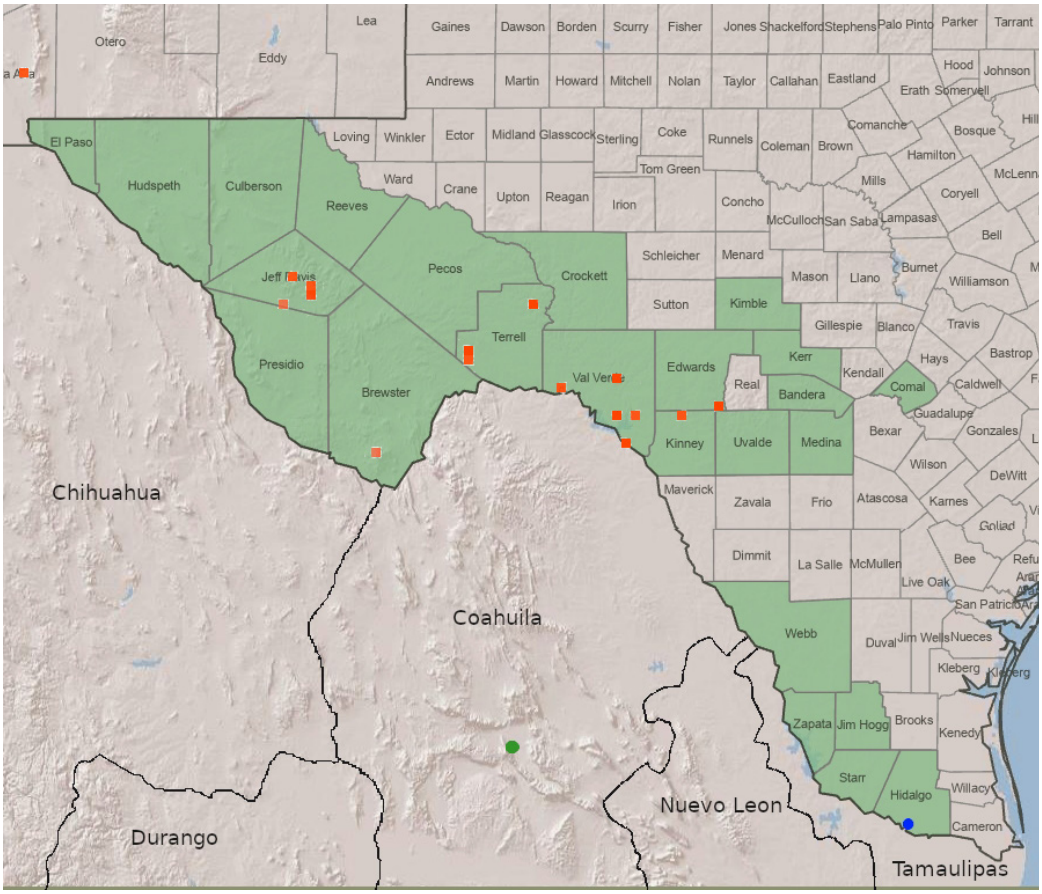

Figure 12: Reported sightings of *Euchaetes helena* nearest to Mission, Texas. Blue circle represents Mission; red squares, iNaturalist; green circle, Nagle and Schmidt (2018).

Comparable species

E. helena is closely related to *Euchaetes nancyae* (Nagle and Schmidt, 2018), a similar moth found in Arizona and, probably, southward. We suspect *nancyae* larvae will also be found to feed on native *Mandevilla*; the main species reported in southern Arizona is *Mandevilla brachysiphon* (Torr.) Pichon (USDA PLANTS Database).

Another white arctiine, *Pygarctia flavidorsalis* (Barnes & McDunnough, 1913), is found throughout the range of *E. helena*. The abdomens of both species have yellow dorsum and white ventrum. Above, the antennae may be used for a tentative identification: those of *E. helena* are white proximally to gray distally, while those of *P. flavidorsalis* are uniformly black (Figs. 13-14). Below, the distinction is clearer since *E. helena* has a row of black spots on each side of the body where the yellow scales give way to white (Figs. 15-16), and the foretibia are white. By contrast, in *P. flavidorsalis* there are no black spots and the foretibia are yellow (Hendricksen, 2017).

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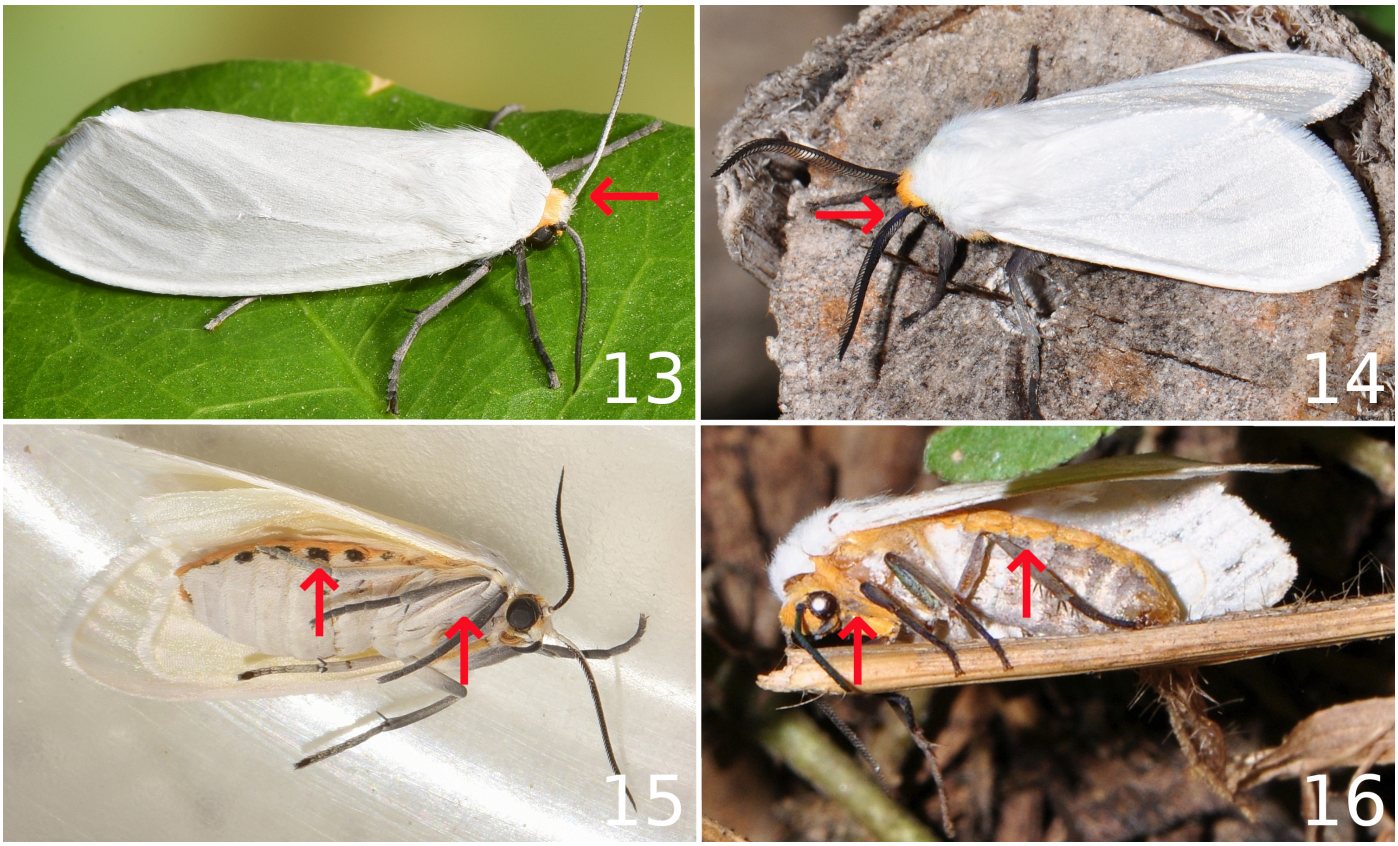

Figures 13-16 Comparison of *E. helena* (left) and *P. flavidorsalis* (right). **13-14** Dorsal views show white-gray antennae of *E. helena* and black antennae of *P. flavidorsalis*; **15-16** ventral views show black spots and white foretibia of *helena* in contrast with the absence of spots and the yellow foretibia of *flavidorsalis*.

Additions and name changes for the Kentucky list of Lepidoptera

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Editor's Note: Loran Gibson sent me this article on March 2 of this year. Little did I know at the time that he would pass away by the end of the month (see Metamorphosis, pg. 108, this issue). He was a long time friend and an exceptional lepidopterist. I will miss him dearly, and am honored to publish this, his last article.

ABSTRACT

The author removes one noctuid name (*Papaipema harrisi* (Grt.) from the Kentucky list. Two tortricid names are deleted and two are added due to newly published information in the tribe Eucosmini. Twenty-two species in ten families are added to the Kentucky List bringing the total number of species for the state to 2702. Numbers of species added for the various families are as follows: Depressariidae (1), Cosmopterigidae (1), Gelechiidae (2), Argyresthiidae (1), Glyphipterigidae (1), Tortricidae (4), Crambidae (5), Pterophoridae (1), Erebidae (1), Noctuidae (4).

INTRODUCTION

Field collecting especially in Ballard and Boone Counties was rewarded with several new state record moths. A few other counties produced new species as well.

Papaipema specimens from Big Black Mountain in Harlan County have been researched extensively by Tony McBride. Individuals from that population were originally determined as *P. harrisi*, due at least partially to a large number of reared specimens from Black Mountain having fed on the unusual Apiaceae host plant *Angelica triquinata*. That moth is now determined as *P. astuta*, so the name *P. harrisii* should be removed from The Kentucky List.

Wright and Gilligan, 2023 provided names for five newly described eucosmine species. One of these names, *Notocelia lobana* Wright & Gilligan, 2023, replaces *N. culminana*

(Wlsm.). The former species was unrecogized until Don Wright compared specimens from the west and northern midwest with specimens from the southern midwest and southeast. The two may occur together in the Great Lakes states and some of New England as *N. culminana* is transcontinental. Kentucky specimenss were determined as *N. culminana* until *N. lobana* was described. *N. culminana* should be replaced on the Kentucky list by *N. lobana.* It is very doubtful that the two occur sympatrically in Kentucky.

Sonia constrictana (Zeller) occurs in Texas and Louisiana. Specimens from Kentucky that were determined as this species should have their determinations changed to *Sonia ferruginana* Wright & Gilligan, 2023. The two are similar but the new species is quite common in our area, and *S constrictana* does not make it into Kentucky. Please change *S. constrictana* to *S. ferruginana* on your Kentucky Lists.

Numbers preceeding generic names and the taxonomic arrangement of species in this list follow Hodges, et al (1983) (the MONA Checklist) and its many additions from various sources. For convenience checklist numbers from the Pohl and Nanz Checklist (2023) are also included and follow each MONA number.

ADDITIONS

Family DEPRESSARIDAE

868.2 (59a0080.2) *Agonopterix paulae* Harrison, 2005
Boone County, Big Bone Lick State Park, 25 August 1979, collected by Loran Gibson, determined by Terry Harrison.

Family COSMOPTERIGIDAE

1487 (59a0381) *Cosmopterix teligera* (Meyrick,1915)
Boone County, several collected in light traps in Big Bone Lick State Park, 11 and 30 May 2023, collected and determined by Loran Gibson, determinations confirmed from male genitalia photos by Terry Harrison and Jim Vargo.

Family GELECHIIDAE

1808 (59a0726) *Coleotechnites eryngiella* (Bottimer,1926)
Hardin County, high quality prairie grassland/ barrens, collected (photographed) by Jessica Slade on 18 November 2022, determined by Shelby Fulton, determination confirmed by Loran Gibson.

2310.1 (59a0532) *Dichomeris kimballi* Hodges, 1986
Boone County, a few collected in light traps in Big Bone Lick State Park on 14 and 23 June 2023. Collected by Loran Gibson, determined by Jim Vargo and Terry Harrison from male genitalia photos.

Family ARGYRESTHIIDAE

2449 (36a0075) *Argyresthia conjugella* Zeller, 1839
Harlan County, Big Black Mountain above 3750' elevation. Collected in light trap on 5 June 2018 by Loran Gibson, determined by Loran Gibson, confirmed by Terry Harrison.

Family GLYPHIPTERIGIDAE

2491 (36a0229) *Acrolepiopsis leucoscia* (Meyrick, 1927)
Boone County, Big Bone Lick State Park, 13 April 2023, collected by Loran Gibson, determined by Terry Harrison.

Family TORTRICIDAE

3183.1 (New species but the author uses 51a1104.2) *Epiblema glaseri* Wright & Gilligan, 2023
Laurel County, Daniel Boone National Forest, ridgetop SW of Ned Branch, 28 August 1992, three specimens collected by Loran Gibson were designated as paratype specimens by Wright & Gilligan, 2023.

3211.1 (New species but the author uses 51a1123.2) *Notocelia lobana* Wright & Gilligan, 2023
Boone County, Big Bone Lick State Park, 25 August 1979, and Bullitt Co., N side Rt. 480, 6.9 mi. East of Rt. 61, 6 September 1989. Both collected by Loran Gibson and determined by Don Wright. Both were previously determined as *N. culminana* (Wlsm.), but that name is removed from the Kentucky List of Lepidoptera in favor of this very similar new species. Both specimens listed above were designated as paratypes by Wright & Gilligan, 2023.

3218.2 (New species but the author uses 51a1117.2) *Sonia ferruginana* Wright & Gilligan, 2023
A specimen of this species from Bracken County, Meldahl Dam, collected by Loran Gibson on 21 June 2007 was designated by Wright and Gilligan, 2023 as the holotype of this very common species. Paratypes were also designated from Boone, Bracken and Campbell Counties, collected mostly from mid-June through mid-July. The species is very common in northern Kentucky and may be the most common *Sonia* species in the state. Specimens collected prior to the description of *S. ferruginana* were mostly determined as *S. constrictana* (Zeller), but that species appears to be restricted to Louisiana and Texas. Specimens determined as *S. constrictana* from Kentucky are probably *S. ferruginana.* Consult Wright and Gilligan, 2023 for a complete discussion of these difficult species.

3218.4 (New species but the author uses 51a117.3) *Sonia griseolana* Wright & Gilligan, 2023
McCracken Co., Paducah Zip Track site, 16 June 2007 (one specimen) and 12 August 2008 (5 specimens), all collected by Loran Gibson in light traps, all determined by Don Wright and designated as paratypes by Wright &

Gilligan, 2023. This is another rdifficult species to separate from the other *Sonia* species. Consult Wright & Gilligan, 2023 for a complete discussion.

3219.3 (New species but the author uses 51a1118.3) *Sonia parva* Wright & Gilligan, 2023

Menifee County, Leatherwood Fork of Indian Creek, four specimens collected 6 July 1991 by Loran Gibson. All determined and designated as paratypes by Don Wright in Wright & Gilligan, 2023. This is a smaller more grayish species compared to the other Kentucky *Sonia.*

Family CRAMBIDAE

4806 (80a1144) *Neocymbopterix heitzmani* Monroe, 1973

Hardin County, high quality prairie grassland/ barrens, one collected 2 June 1994 by Jim Bess. Details of this capture and who determined the individual are unknown.

5108 (80a0905) *Lineodes interrupta* (Zeller, 1873)

Ballard County, Ballard Wildlife Management Area, 9 September 2005, collected and determined by Gerald Burnett.

5151 (80a1099) *Samea multiplicalis* (Guenee, 1854)

Ballard County, Ballard Wildlife Management Area, 20 June 2019, collected and determined by Gerald Burnett.

5256 (80a0918) *Diastictus fracturalis* (Zeller, 1872)

Ballard County, Ballard Wildlife Management Area, 26 May 2019, collected and determined by Gerald Burnett.

5284 (80a1101) *Syngamia florella* (Stoll, In: Cramer, [1781])

Ballard County, Ballard Wildlife Management Area, 28 October 2021, collected and determined by Gerald Burnett.

Family PTEROPHORIDAE

6154 (63A0075) *Pselnophorus belfragei* (Fish, 1881)

Marshall County, U.S Hwy 641 North of Benton, 30 August 2018, photographed by Stacey Hayden and determined as this species from Inaturalist by Deborah Matthews.

Also, Marshall County, Gilbertsville, 30 August 2022, photographed by Hudson Wells and determined as this species by Deborah Matthews.

Family EREBIDAE

8598 (930869) *Melipotis perpendicularis* (Guenee, 1869)

Carlisle County, Doug Travis Wildlife Management Area, 29 July 2009, one collected by Gerald Burnett, determined by Gerald Burnett and James Adams.

Family NOCTUIDAE

8999 (931732.71) *Cydosia aurivitta* Grote & Robinson, 1868

McCreary Co., Devil's Creek Rd., 36° 40' 18" N / 84° 33' 52" W. photographed by Glenn Crisler, determined by Glenn Crisler and Raymond Little.

9741.1 (931650) *Plagiomimicus heitzmani* Poole, 1995

Ballard County, Ballard Wildlife Management Area, Turkey Lake Woods, one collected by Gerald Burnett on 2 September 2016, determined by Gerald Burnett and James Adams.

11137 (932117) *Schinia nubila* (Strecker, 1876)

Ballard County, Ballard Wildlife Management Area, one collected by Gerald Burnett on 8 July 2019, another collected by Gerald on 21 September 2019, determined by Gerald Burnett and James Adams.

11127 (932128) *Schinia ultima* (Strecker,1876)

Ballard County, Ballard Wildlife Management Area, one collected by Gerald Burnett on 31 August 2019, determined by Gerald Burnett and James Adams.

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Wright, D. J. and T. M. Gilligan. 2023. *Epiblema* Hübner, *Sonia* Heinrich, *Suleima* Heinrich, and *Notocelia* Hübner of the Contiguous United States and Canada (Lepidoptera: Tortritricidae: Eucosmini). Wedge Entomological Research Foundation, Bakersfield, California. 280 pp.

The flypoison borer moth, discovered by Eric Quinter. Image by Tony McBride. See related obituary on page 110.

Sphinx lucitiosa (Clemens, 1859) status in New England and recent discovery of a breeding population in New Hampshire

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In the middle of summer in 2024, the authors were exploring a large field bordering the White Mountain National Forest of Carroll Co., New Hampshire (USA) that they have been intermittently monitoring for many years (Fig. 1A). This field is sporadically mowed, but other than that, left alone. Over the many years of observing this site, small trees have begun to creep into the open fields, among them, sapling *Populus* and *Salix* (Fig. 1B, 1C, 1D).

These trees are host to many species of Lepidoptera in this region. In a given year in this field, we can locate a few species of butterfly larvae on these saplings, as well as a dozen or more species of moth larvae. While we had surveyed this location many times previously, it took until 2024 to locate the first Sphingidae species on these saplings.

On July 29, 2024 as the authors were setting up a light trap in the field around dusk, TM happened to glance at a *Populus* sapling leaning over the path behind her. There, she noticed a very large but visibly parasitized Sphingidae larva. Looking closer, it was instantly identified as *Sphinx luscitiosa* (Fig. 2A). This was unusual for many reasons. This species had not been recorded in this part of New Hampshire for many years, with the last record of the species in the state being recorded in June of 1930[1]. Examination of the surrounding saplings did not yield more larvae at dusk, but much more evidence of larval presence was noted. The single larva was collected and a plan to search more thoroughly at night was hatched.

Later that evening, just around midnight, the authors wandered around the site looking for more larvae with UV flashlights. Many species of caterpillars fluoresce under these lights, making them easy to spot[2]. While not every sapling *Populus* had a larva, many did. A total of 14 were collected over the next several nights (Fig. 2B, 2C, 2D, 2E). Many larvae were parasitized, but several were not visibly parasitized. Interestingly, no larvae were recovered on the surrounding *Salix*.

The larvae were reared in a lab setting at the University of Massachusetts in Boston. Daylength was programmed to mimic the natural cycles in late July for New Hampshire, and temperatures were maintained around 22C. Larvae were tested on other species of *Populus* as well as several *Salix sp.* to see if *Salix* was rejected or not. Larvae did consume all species of *Salix* and *Populus* offered (Fig. 3).

Figure 1. Site Location and Images. A. Map of location of field in New Hampshire's White Mountain region. B. Image of the field facing north. C. Image of one of the stands of *Populus* in the field. D. Image of *Populus* host.

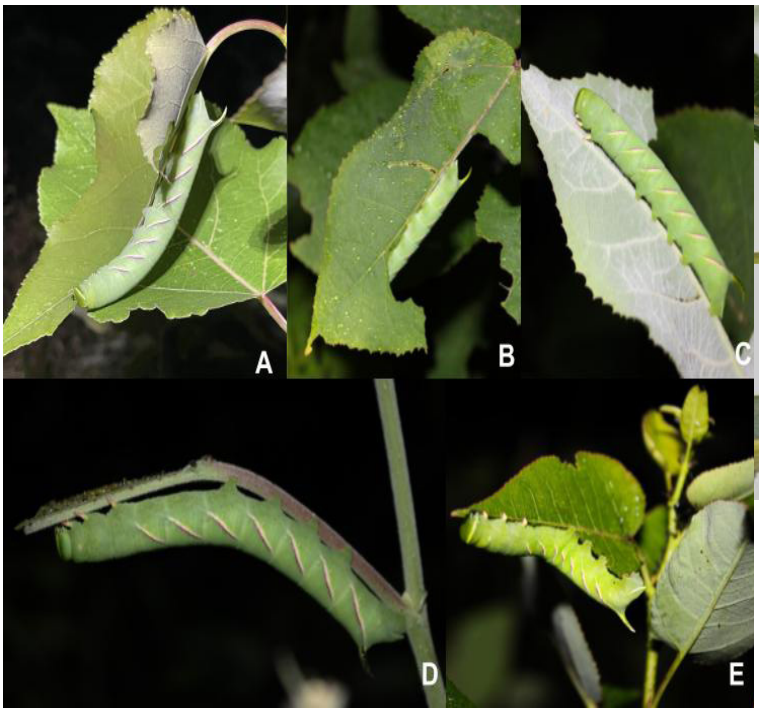

Figure 2 (left). Images of *Sphinx luscitiosa* larvae as found in Carroll Co., New Hampshire (USA). A. First larva found on July 27, 2024; B, C. Same individual, second encountered on July 27, 2024. D. Larva seen on August 2, 2024. E. Another larva encountered August 2, 2024. **Figure 3** (above). *Sphinx luscitiosa* larva in captivity feeding upon *Salix* in host preference test.

To rule out the more common *Sphinx gordius/poecila* complex, two host tests were performed. The first was a choice test, as the *Sphinx gordius/poecila* complex are not known to host on *Salix* or *Populus*, nor will they when offered in laboratory settings. The collected *Sphinx luscitiosa* larvae were individually tested by placing one in a large container (45x15cm) with preferred host in 2 corners (*Populus* and *Salix*), and then on the opposite end, preferred host for the *Sphinx gordius/poecila* complex including *Vaccinium*, *Comptonia*, *Myrica*, and *Spiraea*. Each time, the larvae ignored the alternative hosts, choosing the *Salix* (more frequently) or *Populus*. When left in the rearing container with no options for host except the alternate hosts, the larvae either did not eat at all, choosing to go hungry, or opted for early pupation and becoming prepupal. The larvae that did not become prepupal would resume feeding only when given *Salix* or *Populus*. These two lines of evidence safely rule out these larvae being *Sphinx gordius/poecila*, as currently there is poor understanding of the morphological differences in larvae of these *Sphinx* species.

Several larvae died during pupation due to Tachinidae parasitoids, and another to an Ichneumonidae parasitoid, but a few did successfully pupate. The only parasitoid to emerge in 2024 was the large *Thyreodon atricolor* (Hymenoptera: Ichneumonidae) in October. The remaining pupae were carefully stored in a beverage cooler for the winter to keep temperature and humidity consistent.

Searches in other similar habitats within the White Mountain National Forest yielded no additional larvae. Even adjacent properties to the original location were unsuccessful and without any feeding damage. It is probable that our searching was slightly too late in the year, as all larvae recovered were final instar and nearly full grown, it is likely that any others present would have pupated earlier.

On March 28, 2025, approximately 2 weeks after being removed from the winter storage, a stunning female *S. luscitiosa* eclosed (Fig. 4).

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GBIF data citatons

GBIF.org (24 February 2025) GBIF Occurrence Download https://doi.org/10.15468/dl.jnrn68

Figure 4. Female *Sphinx lucitiosa* from the New Hampshire population. Eclosed approximately 14 days after removal from winter incubation on March 28, 2025.

Automated light traps for moths?

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Moth surveying with light as the attractant has traditionally been done by two methods: (1) manual sampling ("sheeting") -- the observer stands by a sheet during the night and catches or photographs the moths as they arrive; or (2) "funnel trapping" – the observer sets out a trap at dusk, moths attracted by the light go down a funnel to either rest alive on egg cartons or are deposited in a bucket containing a killing agent, and the observer returns in the morning to inspect the catch. However, recent developments have suggested that a third alternative is on the way: "automated light traps" whereby moths arrive at a sheet, are photographed, and the moths in the photos are identified by a computer-vision system.

There is strong economic motivation for the development of such traps, as it could lower the costs of monitoring the prevalence of specific insect pests for the purpose of deciding whether and when to invest in biological or chemical controls for that pest. It could also be used for early detection and survey, permitting a quick reaction to the arrival of invasive species. Ideally, the results would be transmitted electronically to the observer and field visits to the trap are needed only infrequently. A regional, national or global network of interconnected traps sharing information could be the goal (Preti et al., 2021).

Holzhauer et al. (2025) note that this sampling method also has other advantages: it could record the occurrence of insects over the course of a night; it could make it much cheaper to obtain long-term, continuous datasets on moth abundance; and it may be considered to be more ethical than other sampling methods as it is non-lethal and minimizes the disturbance or harm to the insect.

For automated light traps to be feasible, two major components are needed: a camera trap which takes pictures of moths attracted to light, and a computer vision system which identifies the moths.

The pioneering study of Bjerge et al. (2021) contained both components. For eight target species (those which the computer vision system was trained to recognize), 79% of the observed insects were tracked correctly (by comparison to a human observer analyzing the photos). Given the low number of species and low accuracy rate, this was proof of concept only; human observers were not about to be replaced.

Large-scale projects (AMI Consortium and LEPMON) incorporating both components are currently underway, and Mothbox provides an open-source low-cost alternative for do-it-yourselfers. A working automated light trap suitable for practical use remains is not yet available. Still, it would seem to be feasible, as significant progress has been reported on the computer-vision and camera-trap components separately.

Computer Vision

On the computer vision front, the advances made by iNaturalist are impressive. Computer vision requires training sets of observations, and the rapid expansion of iNaturalist observations have made it possible to include many more species, increasing from 55,000 in 2022 to 101,000 three years later (iNaturalist, 2025). For Ontario moths, over 70% of macromoth species are now included (Macnaughton, 2025). iNaturalist reports almost 90% accuracy rate in predicting the species of research-grade insect observations (iNaturalist, 2025).

Korsch et al. (2023) note that citizen-science photos are much simpler to analyze than those from automated light traps because citizen-science photos typically have only one insect in the picture. For pictures from camera traps, the multiple insects in the picture need to be computationally separated into individual "blobs" for identification purposes, and this may be difficult if the insects are of different sizes. Furthermore, this separation needs to be done in the field by the camera setup to reduce the amount of data that needs to be transmitted.

Camera Traps

Significant progress on developing camera traps for moths is reported in a new preprint emerging from the LEPMON project (Holzhauer, 2025).

In the camera light trap (CLT) setup employed, a structure supports a 24-megapixel mirrorless camera pointed at a 24 by 36 cm screen located 50 cm away from the camera. The resulting resolution is much higher than that of the setup of Bjerge et al. (2021). A mostly-UV LED lamp (LepiLED Mini) was mounted above the screen. A roof of transparent polyethylene protected the equipment. The included figure shows LEPMON's current CLT setup, which is broadly similar to that employed in the paper.

Photos were taken by flash every 2-3 minutes between dusk and dawn. All macromoths which could be identified to species were included in the dataset. The identification was done manually (quite a task, given that the project generated 120,000 photos), although it is intended that later LEPMON studies will use computer vision.

Figure. LEPMON'S current camera light trap (CLT) setup.

In one arm of the study, two CLTs were operated in different habitats (one meadow, one forested) for a total of 196 nights from April to September 2023, including nights with rain and freezing temperatures. In another arm of the study, moths were sampled using two non-lethal funnel light traps (FLTs) in nearby (20 m away) locations. The FLTs were operated twice a month for the same range of months, for a total of 12 nights.

For the 12 nights during which both CLTs and FLTs were operated, 101 species were recorded for the FLTs vs. 92 for the CLTs.

Moths in the family Geometridae were more often observed in CLTs than FLTs. This fits the hypothesis derived from unrelated field work by Brehm and Axmacher (2006) that CLTs would perform well for moth species that tend to sit down quietly after approaching the lamp. FLTs could miss these species as they are small and lightweight and may not go down the funnel (instead resting until the early morning hours on the outer parts of the trap or nearby vegetation). Brehm and Axmacher (2006) had found that "sheeting" produces fewer small Geometridae species than FLT operation, particularly the subfamily Sterrhinae

On the other hand, the one species in the family Sphingidae in the study was observed in 5 out of 12 nights by FLTs but was not observed by CLTs at all. This fits the hypotheses that CLTs might not perform well for species that are more active around the lamp. The paper speculates that this finding might apply broadly to other active-behavior families such as Lasiocampidae.

Finally, comparing the 196 nights on which CLTs were operated to the 12 nights on which FLTs were operated, CLTs produce much greater species richness (238 species vs. 101 species). However, 13 species were recorded in FLTs but not in CLTs. Thus, the optimal strategy for future insect monitoring may be to use mostly CLTs because of their lower labor cost, but to use FLTs sporadically to uncover the full set of species in the area.

Future plans of the LEPMON project include adding computer vision to the CLT setup and setting up monitoring locations throughout Germany.

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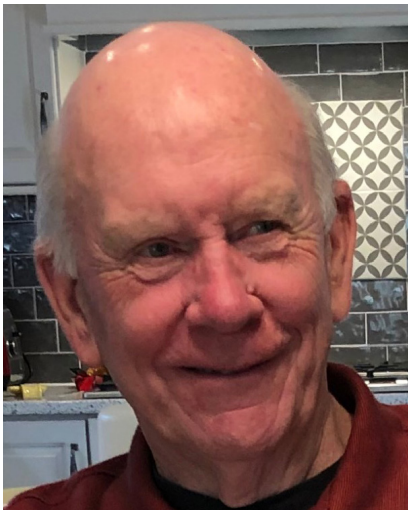
Metamorphosis

Loran Dale Gibson
June 4, 1946 – March 31, 2025



Loran Gibson (2022). Image by Pat Gibson.

Loran Dale Gibson, age 78, of Florence, KY passed away on March 31, 2025, at his home. He was born June 4, 1946 in Dayton, OH. He was a retired Health Environmentalist for the Northern Kentucky Health Department. Loran is survived by his wife of 54 years, Patricia Ann Gibson; sister Sharon Gibson McIntosh; and many nieces, nephews, and cousins.

Loran was a birder, highly skilled woodworker, knowledgeable botanist, amateur astronomer, talented natural history artist, and lepidopterist extraordinaire. He was a member of The Lepidopterists' Society for 54 years (circa 1971). He was also a charter member of both the Society of Kentucky Lepidopterists (SKL; formed in 1974), and Ohio Lepidopterists (1977-78). He served as SKL President for one term, field trip coordinator for decades, and was a board member for most of the SKL's existence.

He began seriously collecting butterflies and moths in the 1960s and became an avid and extremely talented lepidopterist, with a special interest in Tortricidae. He was equally adept and enthused, whether walking a forest trail with a net or working a moth sheet on a moonless night. His extensive knowledge of botany enabled him to understand host relationships and to find both immatures and adults of the species that he was seeking.

In addition to innumerable nights at the sheet and trips to survey butterflies in his native Commonwealth of Kentucky, Loran traveled extensively in search of elusive species and to catalogue species diversity in exotic locales. He participated in 82 expeditions over 45 years that ranged from a few days to several weeks in duration – more than two complete years of his life were spent in the field. His travels in search of Lepidoptera took him to 35 states, Ecuador, French Guiana, Mexico, and Peru (19 times). Whether he was working an arctic ridge in Alaska, a bog in Michigan, the Mojave Desert, or a rain forest in Peru, Loran loved being in the field.

He participated in formal Lepidoptera surveys of Big Black Mountain and Big Bone Lick State Park, Kentucky; Yasuni National Park, Ecuador; and the Cosñipata Region, Peru. Informally, he spent countless hours conducting dozens of faunal studies in Kentucky, that resulted in hundreds of additions to Kentucky's faunal lists. Working with Dr. Charles Covell, Jr., Loran maintained the Kentucky list of Lepidoptera. When Dr. Covell published his annotated checklist of Kentucky Lepidoptera (Covell 1999), he dedicated the book in part to Loran, stating, "In particular, I dedicate it to Loran D. Gibson, with whom I have spent many happy hours at moth lights throughout Kentucky, and whose individual new state records have been legion."

He amassed an exquisitely curated collection exceeding 22,000 specimens. His collection included an amazing number (92) of secondary type specimens, primarily Tortricidae and other micromoths. Portions of his

Left: Loran with the catch from the previous night (2022). Image by Raymond Little. Right: Loran with his long tropical net in Peru, 2016. Image by Ellis Laudermilk

scientifically significant collection will be deposited at the Smithsonian Institutions' National Museum of Natural History in Washington, DC.

Loran authored and coauthored several journal articles, primarily regarding Kentucky's fauna (see bibliography below), and one book, an identification guide to the olethreutine moths of the midwestern U.S. (Gilligan, Wright, and Gibson 2008). His colleagues honored his contributions to Lepidoptera with three patronyms: *Epiblema gibsoni* Wright and Covell, 2003; *Sonia gibsoni* Wright and Gilligan, 2023; and *Pelochrista gibsoni* Wright, 2025 (Wright and Covell 2003; Wright and Gilligan 2023; Wright 2025). Furthermore, the Kentucky House of Representatives honored Loran's work with a formal Citation in 2014.That same year he received Kentucky's Biological Diversity Protection Award from the Kentucky State Nature Preserves Commission for his contributions to conservation of habitats and species all across the Commonwealth. The SKL has given Loran numerous awards over the years for his many contributions to both the SKL and our knowledge of Kentucky Lepidoptera, the last of which was the William R. Black Jr. Memorial Award in 2023.

Loran was a Renaissance man in the truest sense. In addition to his interest in Lepidoptera, he was a knowledgeable Coleopterist and participated in a state-wide survey of tiger beetles in Kentucky. Loran was a talented woodworker and built the drawers and cabinets that house his insect collection. He also crafted his own Schmitt boxes from various woods with decorative or 3D inlaid patterns on the top, often gifting them to his friends and colleagues. He loved classical music and was a talented musician. His ability to sing and whistle shortened many a long drive. Marty Robbins and Jim Croce would have been proud of Loran's renditions of their songs.

Loran was a tireless worker; a patient mentor to scores of aspiring Lepidopterists; a terrific field companion; and a valued and true friend to many. He is sorely missed!

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Ellis Laudermilk, Mike McInnis, and Pat Gibson

Loran receives the William R. Black, Jr. Memorial Award at 2023 SKL Annual Meeting.

Eric Lynn Quinter (1947 – 2024)

An expert on North American Lepidoptera and long-standing life member of the Lepidopterists' Society, Eric Quinter died from esophageal cancer in July 2024.

Eric was born on January 20, 1947 in Pottsville, Schuylkill County, Pennsylvania. His family home in rural Auburn, PA, just north of the Kittatinny Ridge, served as a base of operations for Eric's broad interests in the natural world. Eric's mother provided him with his first butterfly net to encourage his pursuit of Lepidoptera, and at this early age, he also developed what would become lifelong interests in astronomy, rocks and minerals, numismatics, plants, and birds.

Eric began collecting Lepidoptera in the late 1950s in the varied habitats he found throughout his home county. By the time he was a teenager, he had already amassed a collection of thousands of specimens (see below).

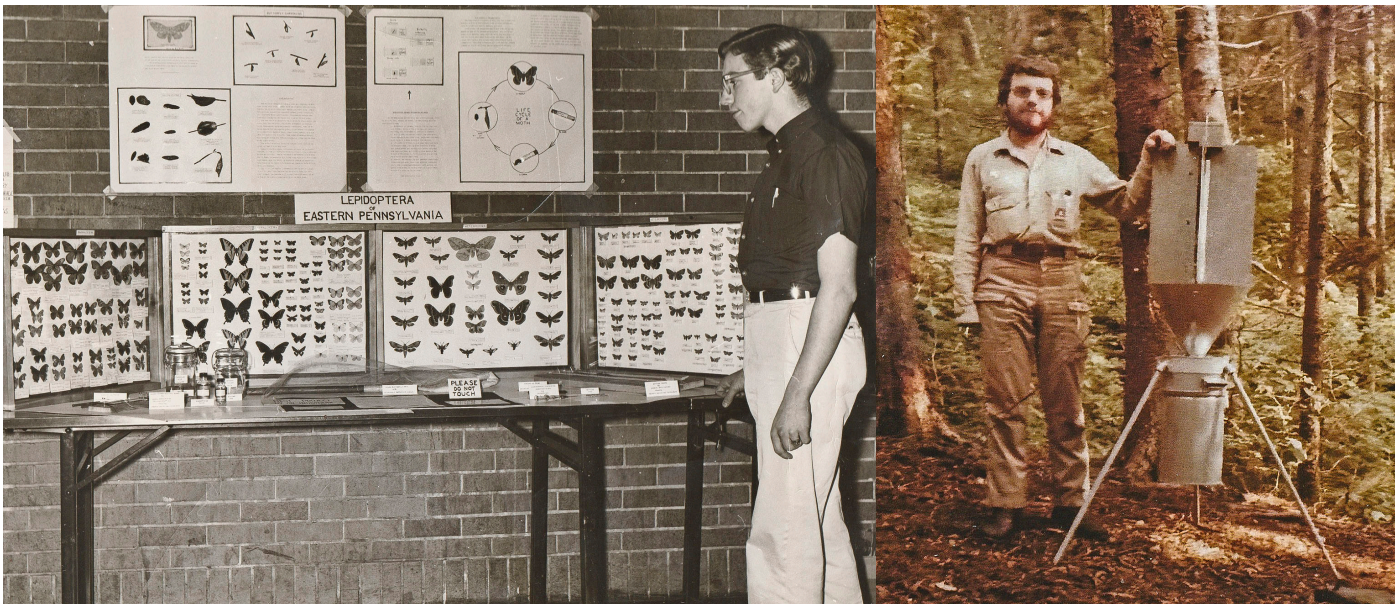
Coincidentally, Eric and fellow lepidopterist Dale Schweitzer grew up not far from each other in eastern Pennsylvania and knew each other as teenagers. Dale relates that they contacted each other through the Lepidopterists' Society Membership Directory, and they formed a lifelong friendship.

Eric's collecting greatly accelerated during the 1970s. In 1971 and 1972, Eric operated eleven ultraviolet light traps in the most diverse habitats he could find in his home county.

On September 19, 1971 at one of these trap sites, an isolated sphagnum bog at the top of the otherwise forested Kittatinny Ridge, Eric captured 3 male specimens of a moth in the genus *Papaipema* that was unknown to science (See image pg. 77). The serendipitous discovery of this attractive borer moth, later found to be using flypoison as a larval host, ignited Eric's lifelong interest in *Papaipema* and other moths in the Tribe Apameini. His extensive field studies resulted in the description of many new species and several new genera.

After short stints in several jobs, Eric was hired by the American Museum of Natural History and worked in various capacities in Invertebrate Zoology and Entomology, retiring in 2004 after 29 years. An intrepid explorer at heart, Eric traveled to numerous exotic locales on museum-sponsored expeditions, including Chile, Argentina, Madagascar, and St. Catherines Island in Georgia, USA. He also personally funded numerous trips to collect in diverse localities and habitats across North America, focusing

Eric spent 10 days on Sable Island, Nova Scotia, Canada in July 1980. His primary purpose was to find the larva of a *Papaipema* species endemic to this remote island. While he found numerous larvae of other moths, the host of his target species is still a mystery. Eric is seen here with one of the feral horses found on the island. The horse doesn't seem particularly feral!



Left: Eric in 1964 at Schuylkill Haven High School standing by his 12th Grade Science Fair Grand Prize-winning project "Lepidoptera of Eastern Pennsylvania." Right: Eric at one of the Pennsylvania trap sites, circa 1971.

Eric prepares to enter the wilds of Okefenokee Swamp in Georgia (USA). Would you get into this overloaded boat?

particularly on the understudied Lepidoptera of canebrakes.

Eric's lifelong collecting efforts resulted in one of the largest collections ever assembled by a private individual. His collection, comprising in excess of 300,000 Nearctic Lepidoptera, is housed in more than 1,000 drawers. While the bulk of these beautifully mounted specimens were collected and prepared by Eric, with many meticulously reared from eggs or larvae, he also acquired specimens from other collectors.

A partial view of Eric's collection in 2024. Daniel Quinter photo.

Eric in September 2010, in his typical field attire, checking a light trap catch at a favorite Connecticut locality, a powerline cut in Chaplin.

Some of these additional specimens came from exchanges with other collectors, including J. Richard Heitzman (Missouri), J. Bolling Sullivan (North Carolina), Vernon Brou (Louisiana), and Mogens Nielsen (Michigan). Others were obtained as remuneration for providing identifications for fellow lepidopterists, particularly Bryant Mather of Mississippi, who, according to Eric, "insisted on sending [him] everything he acquired" (tens of thousands of specimens) to be identified.

Eric's collection included specimens purchased from the following individuals: a portion of the Robert Michael Pyle collection; the entire collection of Ray P. Siebert (Reading, PA), which also contained specimens from the collections of Otto Huelleman (Wallace, Idaho) and Otto Buchholz (Roselle Park, NJ); thousands of specimens, primarily noctuoids from southeastern Arizona, from Robert F. Sternitzky (Hereford, AZ); and a minor portion of the Joseph Muller collection (Lebanon, New Jersey),

The collection also contains significant donations from Mary Ann Carter (Darlington, Pennsylvania), consisting almost entirely of specimens collected by her on her own property. Jeff Ingraham (Brooklyn, New York) entrusted Eric with his collection of approximately 20,000 specimens, which included the small collection of John L. Bull (Far Rockaway, NY), which in turn contained numerous specimens collected by Frank Watson (Astoria, NY). Eric's collection of Lepidoptera was donated to Yale University

December 2022. Eric, Tony McBride, and Chris Schmidt during what would become Eric's last visit to a collection, at the Canadian National Collection of Insects, Arachnids, and Nematodes in Ottawa, Canada. Christi Jaeger photo.

and specimens of other insect orders were donated to the University of Connecticut.

After Eric retired and moved to northeast Connecticut, he finally found the time to complete the Moths of North America fascicle on *Papaipema* and related borer moths (*in press*), a project he had worked on for most of his adult life. During this endeavor, Eric visited nearly 100 collections over a span of more than 50 years to record specimen data.

Post retirement, Eric also had more time to devote to his other lifelong interests. He continued to add to his already significant collection of geological specimens, which emphasized fluorescent minerals and metal ores (see image, page 89). In addition to being a popular speaker at meetings of the Manchester (CT) Gem and Mineral Club, Eric also served as president of the club for several years. He was also active in the Mansfield (CT) Numismatic Society, reflecting his fascination with pennies.

Throughout his life, Eric prioritized forming relationships with other people who shared his interests, and he cherished time spent with them. An excellent storyteller, he entertained around campfires and dinner tables alike.

One of Eric's most noteworthy skills was his ability to inspire others. His vast knowledge, varied interests, sharp wit, and strong interpersonal skills made an instant and lasting impression on those he met. Eric was instrumental in getting several other moth enthusiasts interested in

On a collecting trip to Mo Nielsen's famous "Hut" in Michigan in 2004. From left, Mo Nielsen (decd.), Ted Herig, Eric, and Jim Wiker. Jane O'Donnell photo.

Papaipema and related borers, some of whom he fondly referred to as his "disciples." His work even inspired members of the Kentucky Lepidopterists' Society to engage each fall in a collecting trip aptly named the "Great *Papaipema* Chase" in the canebrakes of that state. In fact, a fascinating 3-hour talk on his discoveries at the 2002 meeting of the Newark Entomological Society in New Jersey, that no one wanted to see come to an end, was the catalyst for the author to pursue his own studies further.

Additional details can be found in Eric's online obituary at Legacy.com.

The author thanks Jane O'Donnell for her friendship and assistance with this obituary.

Tony McBride **tmcbride409@gmail.com**

Eric with the late Bill Black, one of the inspired Kentucky Lepidopterists, in Windham, CT. Eric named a species of *Papaipema* after Bill. Jane O'Donnell photo.

Valeriu Albu
September 25, 1950 – November 10, 2024

Val Albu (2024). Image by Sebastian Albu.

Dr. Valeriu Albu passed away unexpectedly near his home in Friant, CA on November 10, 2024. Those who knew him recognized his embodiment of the American Dream and more: a remarkable, yet gracious man of many talents who dedicated his life to his family and to helping others.

Born in Brasov, Romania on September 25th, 1950, Dr. Albu grew up in a multilingual household where he became fluent in seven languages and developed a passion for nature and music. As a young man, he trained to become a concert pianist, but ultimately chose medicine as his career. Seeking a better life for his family, he emigrated to the United States in 1983 with his wife, Magdalena (see back cover) and young son, Sebastian. After completing his residency in Dayton, Ohio, where his second son, Alexander was born, he worked as an anesthesiologist at St. Francis Hospital in Charleston, West Virginia for more than a decade before moving to Fresno, CA in 2002, where he worked at Clovis Community Medical Center and Fresno Heart & Surgical Hospital until his retirement in 2016.

Upon retirement, Dr. Albu focused on his lifelong passion for studying butterflies and moths, an endeavor that took him and his family to many different countries. During a span of more than fifty years, he collected and catalogued nearly 50,000 specimens from around the world and published several articles in scientific journals. His collection is now housed at the Smithsonian Institution.

Some of our fondest memories are of hiking with him up to mountaintops, across alpine meadows, through narrow canyons, and along the banks of raging rivers and quiet streams. As children, he told us bedtime stories recounting the adventures of his youth. Later, we accompanied him into the desert, where on moonless nights we stayed up late, marveling at the fantastic, winged creatures that emerged out of the darkness. He was a happy and beautiful soul with a pioneering spirit, who led by example and was not afraid to embark into the unknown for those he loved. His kindness and integrity endeared him to all who spent time with him and his dedication to his principles was inspiring. Though we deeply wish we had more time with him, we feel so blessed to have had such a wonderful man in our lives.

Valeriu Albu was preceded in death by his parents, Valeriu and Elisabeta Albu. He is survived by his wife of 49 years, Magdalena, his two sons, Sebastian and Alexander, and four grandchildren, Vanessa, Sebastian, George, and Santiago, whom he loved dearly.

A Celebration of Life Service was held on Saturday, December 14, 2024 at 1:00 pm at Whitehurst Sullivan Burns and Blair Funeral Home, 836 E Nees Ave., Fresno California, 93720.

In lieu of flowers, the family asks that donations, in honor of Valeriu Albu, be made to:

Philip Lorenz International Keyboard Concerts (www.keyboardconcerts.org/support) or Sierra Foothill Conservancy (www.sierrafoothill.org/donate-today/)

Sebastian Albu (Son)

Valeriu Albu in Ventura Co., California, May 10, 2016, looking for yucca moths. Image by Jean-François Landry.

Butterflies of UP Land Grant, Sierra Madre, Laguna, Philippines including a new hostplant record for *Tanaecia calliphorus* (Nymphalidae)

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Abstract. A class field trip was conducted in UP Land Grant, Laguna, Luzon and recorded 37 butterfly species (4 were identified to the genus level) of which 19 species are endemic to the country. The paper also illustrates a newly recorded hostplant for *Tanaecia calliphorus calliphorus* Felder 1863 (Lepidoptera: Nymphalidae).

Introduction

There are more than 7,000 islands in the Philippines and Luzon Island is the largest island in the country. Of the 927 species of butterflies recorded in the country, 464 species (171 endemic) are found in Luzon island (Treadaway & Schroeder, 2012). The shape of the island coupled with mountains of various heights and long mountain ranges influenced the endemicity and unique distribution of flora and fauna including the butterflies.

The University of the Philippines Laguna-Quezon Land Grant (LQLG), or more commonly known as UP Land Grant, was given to the University of the Philippines Los Baños by virtue of Republic Act No. 3608 dated February 8, 1930, as a permanent endowment. Situated in the southern part of the Sierra Madre Mountain Ranges, its 5,729 hectares include open and denuded forestlands located between Real, Quezon, and the towns of Pangil and Siniloan in Laguna. The mosaic landscapes are generally conducive for biodiversity studies and wildlife surveying such as the avifaunal studies by Gonzalez *et al.* (1995). Additionally, the area is home to many threatened and rare bird species, including the poorly known Worcester's Buttonquail. The area also supports a variety of lowland mammals such as rats, civets, fruit bats, the Philippine Warty Pig, and the Long-tailed Macaque (BirdLife International, 2024). Despite the area teeming with wildlife and native plants, the UP Land Grant is still considered as understudied.

Figure 1. Surveying the Secondary forest along Maunlad Road of the UP Land Grant.

Figure 2. Overlooking the forested southeastern mountains of the UP Land Grant

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Figure 3. A *Polyura athamas* inside the bait trap. Figure 4. *Tanaecia calliphorus*. Figure 5. Larva of *Tanaecia calliphorus* feeding on a newly recorded hostplant *Palaquium* (Sapotaceae). Figure 6. *Palaquium* (Sapotaceae) seedling.

The Count Butterfly, *Tanaecia calliphorus* (C. & R. Felder, 1861) (Lepidoptera: Nymphalidae) is a commonly distributed butterfly endemic to the Philippines with four recognized subspecies: ssp. *calliphorus* (Felder, 1863) in Luzon, Polillo, and Babuyanes; ssp. *smaragdifera* (Fruhstorfer, 1912) occurs in Mindoro; and ssp. *treadawayi* (Tsukada, 1991), and *volupia* (Tsukada & Nishiyama, 1981) occur in Camiguin de Luzon. This paper presents known butterflies of the UP Land Grant, Sierra Madre, Luzon, including a newly recorded hostplant of *Tanaecia calliphorus calliphorus*.

Butterflies in UP Land Grant, Sierra Madre

Transect walk counts were conducted along Barangay Maunlad road, U.P. Laguna-Quezon Land Grant, Real, Quezon in December 1-3, 2023 and May 3-5, 2024. Insect sweep nets were used to opportunistically catch butterflies for better observation while some species were photographed. Species identification was done referencing publications by Badon (2014; 2023), Schroeder and Treadaway (2005), Treadaway and Schroeder (2012), and Aoki *et al.* (1982). During the

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Figure 7. *Xanthoneura obscurior*. Figure 8. *Oriens californica.* Figure 9. *Prusiana prusias.* Figure 10. *Choaspes* sp. Figure 11. *Euploea mulciber*. Figure 12. *Mycalesis ita.* Figure 13. *Neptis cymela.* Figure 14. *Moduza urdaneta.* Figure 15. *Athyma kasa.*

transect walk, a total of 26 butterfly species (11 endemics) were observed (EN = Endemic) such as *Menelaides polytes ledebouria* (Eschscholtz 1821), *Menelaides deiphobus rumanzovia* (Eschscholtz, 1821), *Graphium sarpedon sarpedon* (Linnaeus, 1758), *Jamides sp., Nacaduba sp., Eurema sp., Catopsilia pomona pomona* (Fabricius, 1775), *Eurema hecabe hecabe* (Linnaeus, 1758), *Appias nero domitia* (Felder & Felder, 1862), *Delias henningia henningia* (Eschscholtz, 1821), *Hypolimnas bolina philippensis* (Butler, 1874), *Moduza urdaneta urdaneta* (Felder, 1863) (EN), *Ypthima sempera sempera* (C. & R. Felder, 1863) (EN), *Ypthima stellera stellera* (Eschscholtz, 1821) (EN), *Acrophtalmia artemis artemis* (C.& R. Felder, 1861) (EN), *Lexias satrapes satrapes* (Felder, 1861) (EN), *Troides rhadamantus rhadamantus* (Lucas, 1835), *Atrophaneura semperi semperi* (Felder & Felder 1861) (EN), *Euploea mulciber dufresne* (Godart, 1823), *Neptis cymela cymela* Felder & Felder 1863 (EN), *Pantoporia dama dama* (Moore, 1858) (EN), *Oriens californica* (Scudder, 1872) (EN), *Athyma kasa kasa* (Moore, 1858) (EN), *Choaspes* sp., *Prusiana prusias matinus* (Frushtorfer, 1911), and *Xanthoneura obscurior* (de Jong & Treadaway 2007) (EN).

Eighteen modified bait traps were also set up (May 3-5, 2024 only) along the transect about 10-20 meters apart and placed two feet above the ground. For the bait, we used mashed banana with added Tanduay rum. Six species were exclusively caught in the bait traps, with three species being endemic to the country such as *Lethe chandica negrito* (C. & R. Felder, 1863), *Mycalesis ita ita* (C. & R. Felder, 1863) (EN), *Polyura athamas acuta* (Rothschild, 1899), *Mycalesis igoleta igoleta* (C. & R. Felder, 1863) (EN), *Melanitis leda leda* (Linnaeus, 1758), and *Discophora ogina ogina* (Godart, 1824) (EN).

Left: Students of ZOO 150 (Animal Ecology); Right: Students of ZOO 140 (Animal Taxonomy).

Lastly, the following butterflies were observed during the transect walk and also caught in the bait traps: *Tanaecia calliphorus calliphorus* (Felder, 1863) (EN), *Faunis phaon pan* (Schroeder & Treadaway, 2003) (EN), *Culapa tagala tagala* (C. & R. Felder, 1863) (EN), *Zethera pimplea pimplea* (Erichson, 1834) (EN), and *Parantica vitrina vitrina* (C. & R. Felder, 1861) (EN). All five species observed in this category are Philippine endemics.

New hostplant record for *Tanaecia calliphorus*. The observed new host plant is *Palaquium* Blanco (Sapotaceae; see pg. 115). The plant was found in the middle of a *Sygyzium* plantation, although other *Palaquium* trees were found on the outskirts of the plantation. *Tanaecia* butterflies are known to utilize *Ardisia* (Myrsinaceae), *Careya, Planchonia* (Lecythidaceae), *Melastoma* (Melastomataceae), *Diploknema* (Sapotaceae), *Mallotus, Astronia* (Euphorbiaceae), *Eurya* (Theaceae), and *Krukoviella* (Ochnaceae) (Robinson *et al.* 2023; Tan *et al.* 2011; Bell 1909; Wynter-Blyth 1957; Kunte 2000; Nitin *et al.* 2018).

Habitat. The area is situated around 300-400 masl and is a mixed landscape of secondary and primary forests with patches of residential and cultivated areas.

Acknowledgments

The authors would like to thank Reynaldo E. Lorida, Field Manager, Land Grant Management Office and Mary Rose Y. Bocado (UP LQLG Staff) for their assistance during the transect walks along Barangay Maunlad road in the U.P. Laguna-Quezon Land Grant, Quezon, Philippines and accommodations during the trip.

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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.

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

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67 2 Summer	May 12, 2025
3 Fall	August 15, 2025
4 Winter	November 15, 2025
68 1 Spring	February 15, 2026

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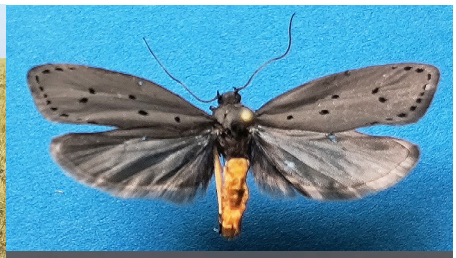

A gully at the Red Hills trapping site north of Hwy. 160 at Tumbleweed Road, Barber Co., Kansas, Aug. 2, 2023. A trap can be seen in this sunrise image at left of center. My (James Adams) shadow can be seen in the upper center just along the ridgeline shadow. Image by James Adams. Right top: *Ethmia monticola*, from Haigler, Dundy Co., Nebraska (July 28, 2023). Right center: *Hystricophora vestaliana*, Devil's Gap, Cheyenne Co., Kansas. Right bottom: *Uresephita reversalis*, Devil's Gap, Cheyenne Co., Kansas. The last two were from July 29, 2023. See related article pg. 78.

Above: Valeriu Albu in sand dunes chasing day active moths. Olancha, Inyo Co., California, May 12, 2016. Right: Valeriu and Magdalena Albu, Yosemite National Park, May 8, 2016 (a rainy trek it was!). Images by Jean-François Landry. See related obituary pg. 113.