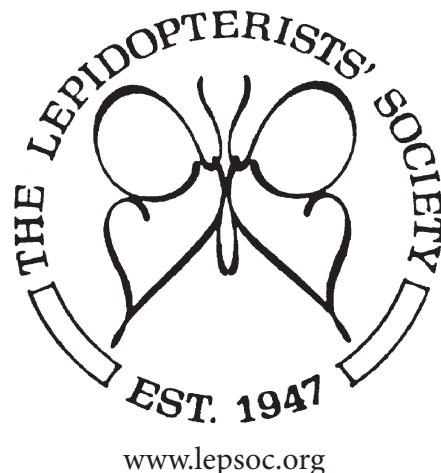

NEWS

OF THE

LEPIDOPTERISTS' SOCIETY

Volume 65, Number 1

Spring 2023



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Butterflies of Veracruz

***Life history of
Lophocampa roseata***

***More on cocoon rattles
from northwest Mexico***

***Butterfly "wash ashores"
in the northeast U.S.A.***

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strophius***

***More Chlosyne nycteis in
Maine, U.S.A.***

***Membership Updates,
Announcements, Book
Review, Marketplace,***

. . . and more!



NEWS OF THE LEPIDOPTERISTS' SOCIETY

Volume 65, Number 1
Spring 2023

The Lepidopterists' Society is a non-profit educational and scientific organization. The objective of the Society, which was formed in May 1947 and formally constituted in December 1950, is "to promote internationally the science of lepidopterology in all its branches; to further the scientifically sound and progressive study of Lepidoptera, to issue periodicals and other publications on Lepidoptera; to facilitate the exchange of specimens and ideas by both the professional worker and the amateur in the field; to compile and distribute information to other organizations and individuals for purposes of education and conservation and appreciation of Lepidoptera; and to secure cooperation in all measures" directed towards these aims. (Article II, Constitution of The Lepidopterists' Society.)

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Front Cover:

Lophocampa roseata, the Rosy Aemilia, final instar larva, Vashon Island, WA, United States, October 10th, 2021. Photo by Christie Caldwell; see associated article, next page.

Life history of *Lophocampa roseata* (Walker, 1868)

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Figure 1. *Lophocampa roseata* adult female (mother of reared larvae).

Introduction. The rosy Aemilia, *Lophocampa roseata*, is a little-studied (and quite charismatic) arctiine that is found in the Pacific Northwest, with a possibly connected population in the Southwestern United States. A written record of the species was published in Vol. 55 of the Journal of the Entomological Society of British Columbia (Hardy 1958), but is incomplete, listing only four instars, and does not contain images. Over the past year, I reared this species from the egg, and was excited to take on the challenge after several years of interest.

The female was found actively feeding on a Douglas-fir (*Pseudotsuga menziesii*) as a final instar larva in King County, WA, in October 2021. The caterpillar was collected and overwintered in a cocoon until July 2022, when it emerged as a moth (Fig. 1). This individual attracted three males the evening after she emerged, and they were temporarily placed into her enclosure. One male was left in her enclosure after the night they arrived to prevent her from becoming overwhelmed in the egg-laying process. No males arrived after her second evening.



Figures 2 & 3. Above, Fig. 2: Eggs 48 hours from hatching. Below, Fig. 3: Eggs within minutes of hatching. **Figure 4.** Neonate first instar, where pores have not yet darkened. Slightly older first instar at right with darkened pores. **Figure 5.** Second instar feeding on a Douglas-fir needle.

Ovum (Figures 2 & 3). The female began ovipositing by her third evening as an adult, and steadily continued for five days. Eggs are round with a flattened, slightly concave base, and are laid in lines with a few ending in small clusters on the sides of the container, totaling ~160. New eggs are a solid pearly green. As eggs develop, a dark green spot appears (Fig. 2). Eggs rapidly change color toward the hatching of the larvae and begin to darken into a murky reddish-brown, then hours before hatching, black hairs of the larvae become visible as they press against the egg's wall in a wrapped-around fashion, along with the distinctive large reddish spot of the head (Fig. 3).

First instar (Figure 4). The first larvae emerged six days after the first eggs were laid in the evening. The amount of eggshell consumed varies with each individual, from just the exit hole to half of the shell. Its reddish-brown head is covered in short, light hairs, with a creamy yellow body and black setae. Setae follicles darken from the body color to almost black over several hours. The caterpillars feed in jagged, "scraped" lines along the surface of the needle, excreting yellow-green frass along the way. Most individuals develop a deep red "saddle" along the dorsum when approaching their first molt. Larvae promptly drop down on a string of silk when disturbed. Caterpillars do not seem to show a strong preference regarding proximity to siblings along the parts of the Douglas-fir sprig.

Second instar (Figure 5). The main difference between the first and second instars is noticeably more, and differently-colored, setae in the second instar. Setae now vary in color from individual to individual, from black to a lighter



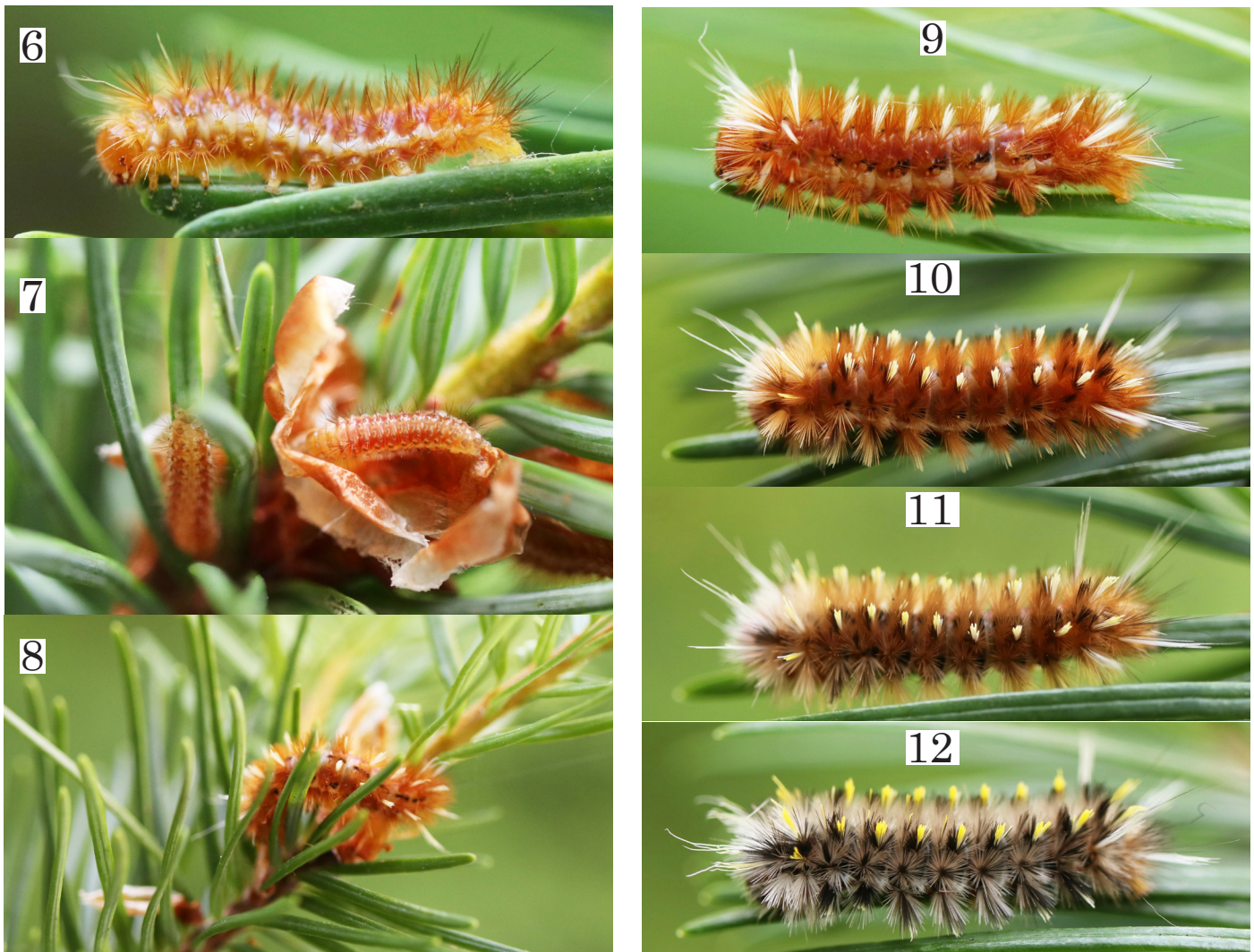


Figure 6. Third instar showing more complexity in setae than before. **Figures 7 & 8.** Concealing coloration and behaviors in red individuals. Early instars are often observed gathering on the broken needle buds and cone scales of the sprig to molt, and match the color closely. **Figure 9.** Fourth instar, demonstrating new bright white hair tufts. **Figures 10, 11, & 12.** Different fifth instar individuals demonstrating variation in coloration. Above, 10: Red. Middle, 11: Brown. Below, 12: Gray.

rusty-brown. Some individuals consume part of the black exuviae once molted. Head is reddish as before, and the body is red with a creamy line beneath the spiracles into the last segment. The head darkens from a creamy color. The larvae scrape deeper into the needle, still in jagged lines, often toward the tip of the needle and back up to continue feeding. Green is visible underneath the insect's skin as it feeds.

Third instar (Figure 6). Many more rusty hairs appear in the third instar. Light stripe is as before. The setae are much more varied in length, with several longer light hairs pointing forward near the head, and dark hairs pointing backwards at its last segment. Feeding habits are similar, with caterpillars often beginning toward the tip of the needle. A pattern emerges where many needles are eaten halfway in thickness, and halfway along from the needle tip. The body becomes a deep red approaching a molt, with a semi-transparent head capsule as it lifts from the new one.

Fourth instar (Figure 9). In its fourth instar, the caterpillar becomes incredibly vibrant. Bright red setae cover most of the insect, with white tufts on either side of the dorsum. A few white hairs line the lowest tufts. Additional white hair pencils point forward and backward, in the same position as in the third instar but far more robust. A few long, black hairs point off the posterior. A black dashed stripe of pigment now extends dorsally from behind the head to the end of the caterpillar, and black markings appear above the long light stripe on either side of the body.

Fifth instar (Figures 10, 11, & 12). The fifth instar shows a surprising amount of variation in coloration. The main setal color ranges from reddish (Fig. 10) to a warm gray (Fig. 12), with the dorsal tufts also ranging from a light cream to a bright yellow. Black setae surround these tufts in most color varieties observed. The white hair pencils remain as well as the few long, black hairs. The majority of the brood's caterpillars in this instar display the red color

variety (Fig. 10), with only a few brown (Fig. 11) or gray (Fig. 12). The heads of the caterpillars also vary in coloration with each setal variation—red in red-haired individuals, to black in gray-haired individuals (Fig. 13). Needles are now consumed in a manner that leaves only a very small line of the needle attached to the main twig, if at all.

Note on instars. Molting was observed throughout the caterpillar's life cycle, and head capsules were collected with each cleaning (frass removal) of the enclosure (Figure 14). Some of the molts—especially those of the younger instars—were discovered through head capsules and remaining exuviae. The collected head capsules follow Dyar's exponential growth observation for lepidopterans (Dyar 1890), where many species (including several other arctiines) show an increase in head capsule width of 1.4x from one instar to the next. All head capsules collected fit into one of the six size categories. The final instar's head capsule in Fig. 14 was obtained through a deceased individual rather than a recently-pupated individual in order to show the complete, unbroken capsule for comparison purposes.

Sixth instar (Figure 15 & 16; front cover). In its final instar, the larvae's coloration changes quite drastically from the deep red of most fifth instars. It is now gray, with more black surrounding bright yellow tufts in two rows along its dorsum. White hair pencils remain in the same placement as before. The integument is black with irregular white rings between segments. The ventrum is a reddish pink

with gray and orange-yellow. Its head is black with white between plates. The caterpillar feeds on large areas of the branch at a time, consuming most or all of each needle.

Pupa (Figures 17 & 18). The caterpillar stops feeding after several days and begins its walkabout, quickly moving through the enclosure to find a spot to pupate. Most caterpillars begin to create a cocoon under the leaf litter lining the base of the enclosure, with a few creating cocoons tucked into the remaining Douglas-fir branches (Fig. 17). The pupa itself begins a cream color, and darkens over several hours into a deep red (Fig. 18). The caterpillar creates a cocoon that results in an overall gray color from the mixture of its hairs (Fig. 18). The cocoon, as with the moth itself, is noticeably smaller than that of its close cousin, *Lophocampa maculata*. The loose hairs of the cocoon are irritating to the skin, causing an unpleasant burning and itching sensation. Tweezers are mostly effective in removing these hairs.

Final Thoughts. There are many interesting aspects of this moth's life cycle, and many questions that remain unanswered. Pigment analysis, as performed by Kenneth Strothkamp in the related *L. maculata* (Strothkamp 2016), may be worth exploring in the final few instars of this species, given the variation in coloration within an instar. Another area of study that may be explored is its actual

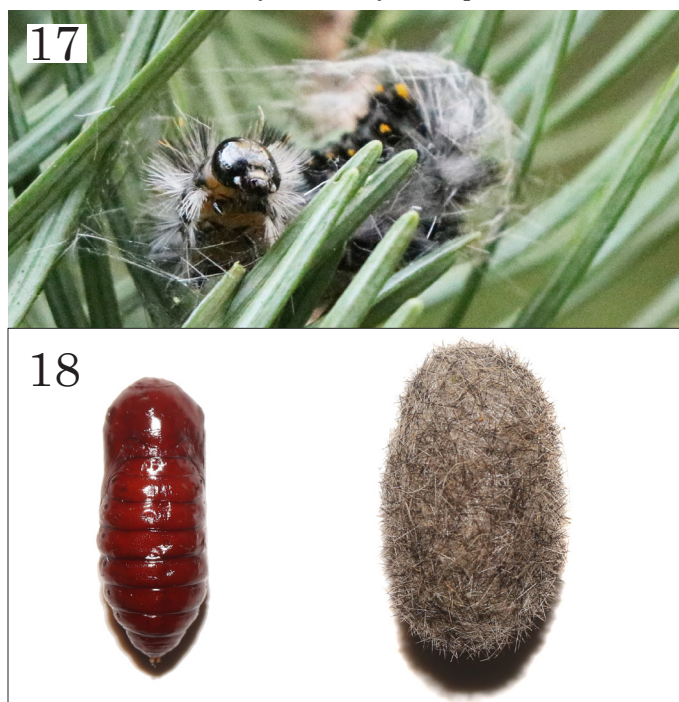
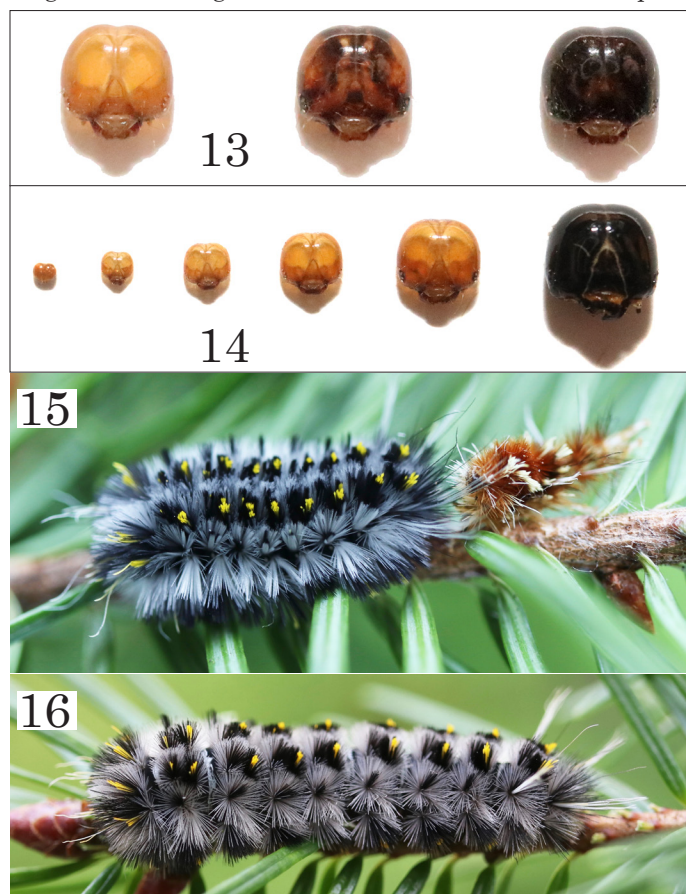


Figure 13. Fifth instar head capsules showing a variety of coloration. **Figure 14.** Left to right: earliest to latest instars; 1-6. Head capsules were measured and compared to Dyar's 1.4x width increase observations, which they followed. **Figure 15.** Newly-molted final instar, showing bright red exuvia. **Figure 16.** Final instar resting on a Douglas-fir sprig. **Figures 17 & 18.** Above, Fig. 17: Final instar creating its cocoon in preparation for pupation among the Douglas-fir needles. Below, Fig. 18: Left, pupa, right, cocoon.

range, and whether or not the Pacific Northwest and Southwest populations are connected through the Rocky Mountains or otherwise. It appears to be significantly less common than its other conifer-feeding (and overlapping in range) cousin, *L. argentata*, and its life cycle seems to match closer to that of *L. maculata*. These differences and similarities should be explored in order to better understand, and therefore, preserve, this beautiful species.

Acknowledgements. This research was greatly aided by the help of Dr. Kenneth Strothkamp and Dr. David Wagner, who each offered immense amounts of knowledge and advice throughout this process over the years. I would also like to thank my friends and family for their help and support, including my botanist friends (who successfully helped me search for this critter on

more than one occasion), my husband, who helped feed the caterpillars every day, and my mother, who checks under the Douglas-fir every fall before work for any caterpillars on walkabout.

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More on cocoon rattles from northwest Mexico

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The Summer 2022 issue of *News* (Vol. 64:2) featured "Cocoon Rattles: an Intriguing Aspect of Lepidopterology" by Richard S. Peigler, an entomologist at University of the Incarnate Word, San Antonio, Texas. The theme centers on how the cocoons of several species of wild giant silk moths are recycled into traditional musical instruments by several American, Mexican, and African indigenous cultures. Because of the unique (and fascinating) subject matter, I am repeating salient points in the Peigler article (restricting commentary to North American cultures) and contributing my personal interests and empirical experiences.

Within the xeric regions of the American southwest and northwestern Mexico, cocoons of large silk moths are recycled into cocoon rattles, commonly referred to as *ténabares* in both English and Spanish. The kingpin species is *Rothschildia cincta* with *Eupackardia calleta* placing second. Taxonomically, both species belong to the family Saturniidae, subfamily Saturniinae—commonly referred to as silk moths. For numberless years, *R. cincta* has been venerated by Mayo (*Yoreme*), Papago (*Tohono O'odham*), Pima (*Akimel O'odham*), Seri (*Comacáac*), Yaqui (*Yoeme*), and Tarahumara (*Rarámuri*) tribes. That nexus continues to this day, albeit now struggling to survive because of escalating environmental degradation.

A *Rothschildia* adult resonates beauty. Wingspan extends four to five inches. Shades of brown augmented with white/reddish vertical bands dominate. Each wing is accented with a large, triangular clear patch resembling a pane of glass or mirror. These four transparent patches have sparked the species' local name: *mariposa cuatro espejos* ("butterfly with four mirrors").

R. cincta is Neotropical, commonly found throughout much of the Sonoran Desert ecosystem, especially in northwest

Mexico (states of Sonora and Sinaloa), Baja California, and extreme southern Arizona (Pima and Santa Cruz counties); in the last decade or so, the species has not been observed in the wild in Arizona.

(Editor's Note: I (James Adams) personally encountered adults of *R. cincta* in southeastern Arizona in summer of 2017, and, through social media, am aware of others that have been encountered sporadically since that summer. News of the species' "demise" in Arizona is premature.)

There is only a single generation per year but adults often eclose throughout the entire wet season. Adults lack functional mouthparts, effectively eliminating the need to feed. In addition, adults are nocturnal and are attracted to artificial lights during the mid-summer monsoon season (August/September). Young larvae are gregarious, older instars, solitary. The primary larval foodplant is *Jatropha* (sangre de Cristo, sangre-de-drago, limberbush), a xerophytic shrub in the family Euphorbiaceae; however, willow (*Salix*) and wild black cherry (*Pruus serotina*) are also appropriated.

Late instar larvae are solitary, large, plump, and bright green. The abdomen is accented with six prominent transverse white stripes—each bordered interiorly by a thin black edge; there are no spines although the dorsum is punctuated with short tubercles/scoli. Larvae are non-toxic to vertebrates. Silken cocoons are spun from secretions from the salivary glands of larvae (as is the case with the historic/economically important Chinese domestic silk moth, *Bombyx mori*, family Bombycidae—a close relative of Saturniidae). Cocoons of the American *mariposa cuatro espejos* are not concealed in leaves but are suspended openly by a prominent silk stalk (peduncle) from a twig of the host plant or another nearby species. Because

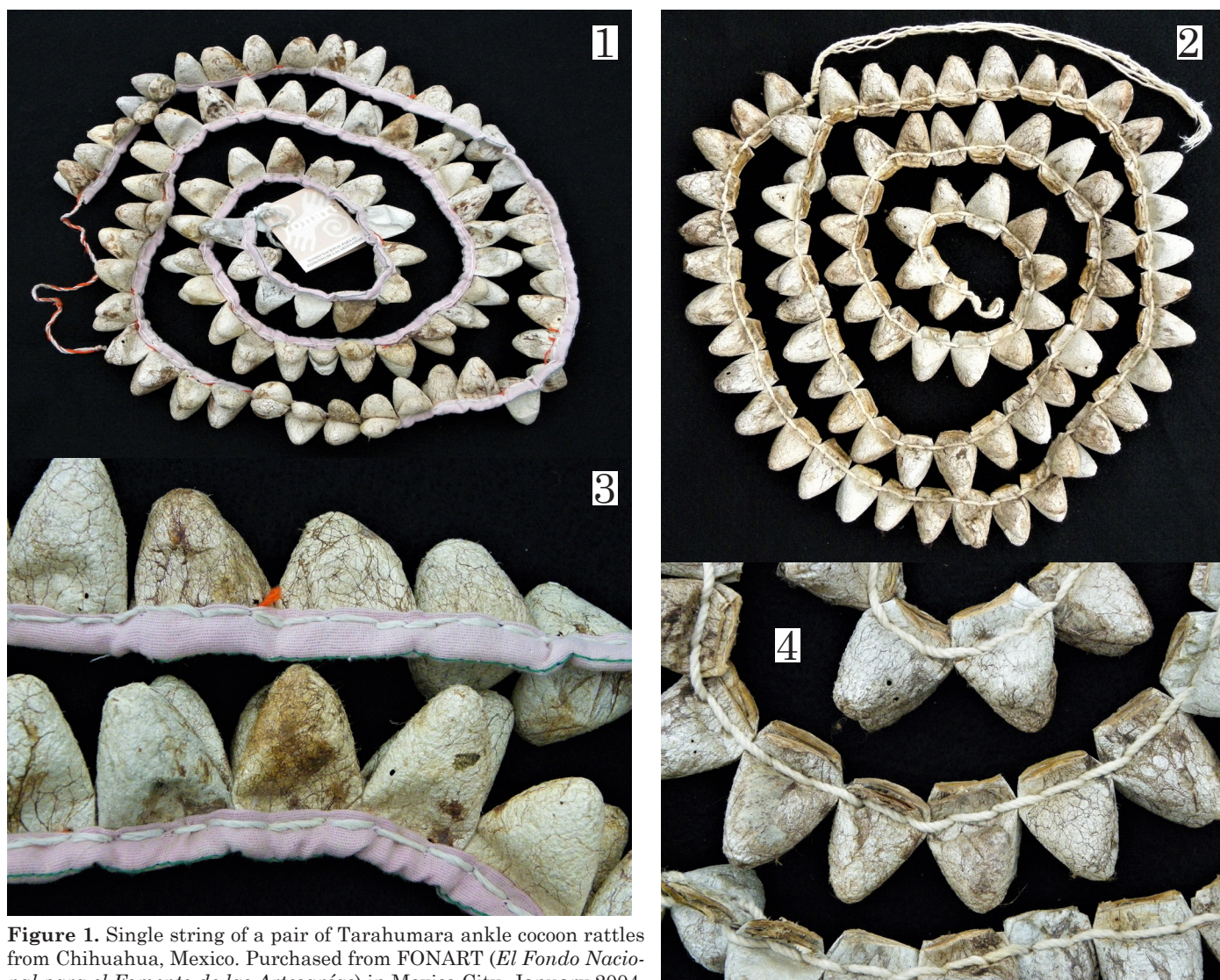


Figure 1. Single string of a pair of Tarahumara ankle cocoon rattles from Chihuahua, Mexico. Purchased from FONART (*El Fondo Nacional para el Fomento de las Artesanías*) in Mexico City, January 2004. Total cocoons: 312 divided between two strings, each approximately 78 inches in length. Weight of two strings: 7.5 ounces (212.621 grams). Original tag indicates a collection date of November 2003, Chihuahua, Mexico. Price: \$200.00 U.S. **Figure 2.** Single string of a pair of Mayo ankle cocoon rattles from San Bernardo, Sonora, Mexico. Purchased from Larry and Nancy Hagberg (SIL International/Wycliffe Bible Translators), a Christian based missionary/linguist family to the Mayo. March 2004. Total cocoons: 314 divided between two strings, each approximately 78 inches in length. Weight of two strings: 10.5 ounces (297.670 grams). Price (includes two short strings in Fig. 5): \$200.00. **Figure 3.** Close-up of a section of the string in Fig. 1. **Figure 4.** Close-up of a section of the string in Fig. 2.

a filament of cocoon silk has a tensile strength catalogued as “moderate”—a ranking slightly below spider silk, the toughest natural fiber known to man—cocoon silk can persist in their native xeric environment for several years subsequent to the eclosion of adults.

Preparation of cocoon rattles is labor intensive. Subsequent to collection (usually in the field), the peduncle and anterior end of a spent cocoon are clipped off. This facilitates the insertion of a few bits of gravel/pebbles, often gathered from the mounds of ubiquitous colonial, stinging harvester ants (*Pogonomyrmex*). The modified cocoon is then stitched closed. After pairing with another cocoon, the couplet is attached in tandem with others along culturally distinct types of pliable strands (examples include

coarse commercial string, braided fiber, strips of cloth, and strips of buckskin). Length of each strand can vary: short (a foot or so featuring only a dozen or so cocoons) for fashioning into handheld rattles, but long (three to eight feet consisting of 100-500 cocoons) if intended to wrap around a dancer's entire lower legs. When shaken, the “grit” striking the cocoon's inner dry leather-like walls produces a crisp high-pitched rustle or “rattle”—a sound similar to that of dried seeds within a small paper bag. The sound is distinctive and quite audible and often accompanied by melodies and rhythms from simple hand-crafted instruments. A cocoon rattle is technically an *idiophone*, and its sounds are revered as an integral component of the culture's ceremonial music and sacred mythology. The ceremonial dances renew the ties between the past and present, the physical



Figure 5. Mayo cocoon rattles from San Bernardo, Sonora, Mexico. Purchased from Larry and Nancy Hagberg (see caption for Fig. 2). April 30, 2007. Two individual short strings: one 32 inches, one 58 inches. Shorter string: 78 cocoons, weight: 2.5 ounces (70.874 grams); longer string, 142 cocoons, weight 3.0 ounces (85.047 grams). Possibly for use as ankle rattles for a short person in the “Deer Dance,” or simply, unfinished ankle rattles. Price: included in purchase of rattles in Fig. 2.

and the metaphysical. Simply put, the dances are the repositories—the “soul”—of the culture (see Simonett 2016 for more details).

Cocoon idiophones are the proud sway of two types of dancers: (1) *pascola* dancers—older men who usually officiate and perform at public and private ceremonies such as Holy Week and weddings/funerals; idiophones consisting of up to 500 cocoons per strand are required in order to create relatively loud sounds; and (2) deer dancers—athletic men who perform the sacred *La Danza del Venado* (“Deer Dance”). For the latter, idiophones of only 100–160 cocoons per string are preferred. This lessens overall weight, reduces abrasion to legs during high intensity athleticism, and imitates the shy movements of the deer. The iconic and dramatic *La Danza del Venado* of the Mayo, Yaqui, and Tarahumara has become standard on the program of the internationally acclaimed/award-winning *Ballet Folklórico de México* founded in 1952 by Amalia Hernández. To accommodate the contemporary theater genre, Hernández tweaked the original ritualistic dance. Currently, the eye-popping dancers of the parent company perform three times each week at Mexico City’s opulent *Palacio de Bellas Artes* (“Palace of Fine Arts”). Touring companies of the *Ballet* have performed in over 300 cities within 80 countries. (NOTE: *La Danza del Venado*, in both its original form and as presented by the *Ballet Folklórico de México*, can be viewed on YOUTUBE.)

History aside, I have nurtured a lifelong interest in ethnobiology—particularly natural dyes and textile production in indigenous American cultures (see selected citations under Ross in **References**). In fact, during my personal

research on textiles in southern Mexico during the 1970s and 1980s, I had secured for my private collection two complete and one partial set of cocoon ankle rattles: one set from the Tarahumara, one set, and two short strings from the Mayo. I was introduced to the handicraft by linguist/missionary friends. But subsequent to collecting, I had stored the cocoon rattles in plastic bags containing naphthalene balls—a fumigant to stave off mold and insect pests.

That said, the recent seminal review of cocoon rattles by Richard Peigler is most likely comprehensive enough to satisfy most readers and researchers. Nevertheless, anthropologists often are disquieted when it comes to the future status of hand-crafted items of indigenous peoples. General consensus is that historical artistic expressions will soon be relegated to memories, photographs, and holdings in museum and private collections. Indeed, as early as the 1970s, astute locals in both Arizona

and Mexico began reporting a decreasing scarcity of cocoons being collected in the wild. Reasons? The following have been suggested: (1) cultural assimilation with the abandonment of historic values, (2) reduction and/or destruction of natural habitats due to increased urbanization and agriculture, (3) above-average adverse weather, (4) accelerated climate change that is producing more extreme weather, (5) changes in planting strategies (from the truck farming of labor-intensive vegetable crops to high-tech mechanized, large scale agronomy centered on rice and corn), (6) increased agricultural pollutants from fertilizers and pesticides/herbicides, and (7) over-harvesting by both locals and outsiders for the burgeoning and lucrative tourist trade. With such evolution, the extinction of *R. cincta* is probably inescapable. As a lepidopterist, I felt compelled to document my meager holdings of cocoon idiophones in the figures above.

Acknowledgements

I was inspired by Richard S. Peigler to prepare this story. Without his fascinating treatise on rattle cocoons printed in the Summer 2022 issue of this periodical, my cocoon rattles would have remained buried within my collections of indigenous Mexican folk arts. Ergo, I extend my utmost thanks to Richard. Also, I thank the numerous linguist/missionary individuals and families—especially Lawrence (Larry) R. Hagberg and Nancy Hagberg—affiliated with SIL International (formerly, Instituto Lingüístico de Verano) and Wycliffe Bible Translators (WBT), Summer Headquarters, Mitla, Oaxaca, Mexico, for guidance during my ethnobiological pursuits within Native American cultures in rural southern Mexico between the 1970s and the early 2000s.

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www.butterfliesandmoths.org/Rothschildia-cincta

www.YouTube.com: Ballet Folklórico de México-La Danza del Venado

Membership Updates

Chris Grinter

Includes ALL CHANGES received by February 14, 2023. Direct corrections and additions to Chris Grinter, cgrinter@gmail.com.

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

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Conservation Matters: Contributions from the Conservation Committee**Towards a global butterfly indicator**

Holly Mynott

Butterfly Conservation, Manor Yard, East Lulworth, Wareham, Dorset BH20 5QP, United Kingdom
 hmynott@butterfly-conservation.org

This audience is well aware of the importance of insects. They are the most diverse group of animals on the planet, making up two thirds of animal species and 80% of terrestrial biodiversity. As well as their intrinsic value, they provide such important ecosystem services that even without including pollination, they contribute an estimated annual value of \$57 billion to the US economy alone.

Despite this, it has been well-established that many insect populations are in decline across the world. A global review made headlines in 2019 as it reported that more than 41% of insect species are declining, and a third are imperiled in some countries. While these figures have faced criticism, many different studies have also reported declines in abundance, usually at rates of 1-2% per year.

Even with this evidence, there are still many gaps in our knowledge about insect population trends. This is due to a wider bias in research towards “more charismatic” vertebrates. Data from the International Union for the Conservation of Nature (IUCN) Red List makes this bias very clear: 91% of mammal species and 100% of bird species have been evaluated so far, compared to just 1.1% of named insect species. The data gap is particularly wide in the global south and tropics, which despite being less well-surveyed, include some of the most biodiverse areas of the world.



Aglais io, Peacock butterfly, Europe (photo from UK)

Addressing this data gap would make an important contribution to tackling the global biodiversity crisis. At a local scale, monitoring data can help conservationists to use their limited funds to identify and implement the best actions for species. At a large scale, monitoring can impact policy that affects biodiversity conservation. However, insects are currently missing from most of the indicators used by the international community to measure progress on global biodiversity commitments.

Since COP15 in December 2022, Parties to the Convention on Biological Diversity are working towards the Kunming-Montreal Global Biodiversity Framework, to guide global action on nature. This includes four goals and 23 targets which must be achieved by 2030. Goal A is to “prevent species extinction [...], loss of ecosystem integrity [...], and loss of genetic diversity,” and 13 headline and component indicators are being used to measure progress towards it. Most of these indicators are at ecosystem or habitat level: for example, the Red List of Ecosystems, and the Ecosystem Intactness Index. Only two indicators include data on species-level population change: the Red List Index, and the Living Planet Index. However, neither of these include any insects.

Insects are missing from these indicators because of a lack of data. The Red List Index shows trends in overall extinction risk, but it only includes taxonomic groups in which all species have been assessed at least twice. This is not the case for insects. The Living Planet Index is a measure of the state of the world's biodiversity, based on population trends from ~21,000 populations of ~4,000 vertebrate species. Again, insects are not included – this is because they are less well-monitored than vertebrates.

Addressing knowledge gaps in insect population trends is therefore vital. How can the global community conserve insects if it does not measure or understand what is happening to them? It is difficult, however, to assess the status of most insect groups, due to the lack of standardised monitoring methods and the challenges of identifying species.

The Global Butterfly Index project seeks to address this problem. Of all insects, butterflies are best placed to provide a global index to represent insect biodiversity. They are the best monitored invertebrate group, due to their beauty and popularity with the public, and because they are relatively easy to identify compared to other insects.



Dryadula phaetusa, banded orange Heliconian, Costa Rica

They are considered good indicator species both for the status of other insects, and also for the health of the environment, as their short life cycles, limited dispersal ability, and sensitivity to climatic conditions mean they react quickly to environmental changes.

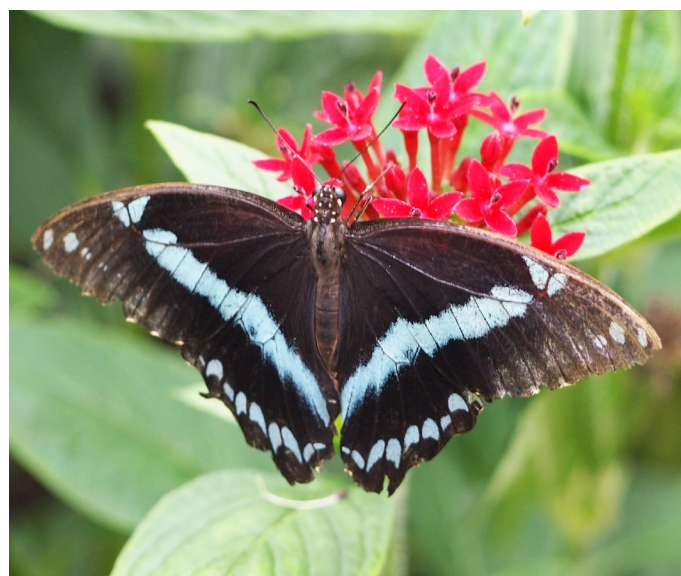
The idea for a Global Butterfly Index came about from work by the Zoological Society of London, who produce the Living Planet Index. They tried to address the lack of insect data in the index by hiring Masters student interns in 2016/17 and 2018/19 to search published literature for butterfly data. The students gathered 1,154 time-series datasets for 385 butterfly species, but the result still had many data gaps, even for temperate countries – notably, the USA, where much butterfly occurrence data resides in proprietary databases, such as the North American Butterfly Association's 4th of July Butterfly Count and state-specific databases. The team therefore felt that there weren't enough data to publish a Living Planet Index trend for butterflies. However, the students also made it known that much existing data had not yet been accessed – what if this could be gathered as part of a longer-term project, not only to contribute to the LPI, but to also create a separate butterfly index to reflect insect trends? After reaching out to other organisations (Butterfly Conservation, Butterfly Conservation Europe, De Vlinderstichting, IUCN SSC Butterflies & Moths, and the UK Centre for Ecology & Hydrology), there was much enthusiasm to continue efforts to create a Global Butterfly Index.

The Global Butterfly Index project aims are to: (a) create a global indicator to detect population changes which is less biased towards Europe and North America, (b) provide a mechanism to understand drivers of change across all biogeographic regions, and (c) establish an invertebrate group firmly in the global biodiversity indicator and policy space.

Without dedicated funding thus far, the Global Butterfly Index team has found synergies with other projects to

make progress. De Vlinderstichting, the UK Centre for Ecology & Hydrology, and Butterfly Conservation Europe have been working on projects funded by the EU ("ABLE" and "SPRING") to expand butterfly monitoring to every country in the European Union. Currently, 21 of the 27 EU countries are undertaking butterfly monitoring using standardised protocols, mostly undertaken by citizen scientists, which is a cost-effective way to collect robust butterfly data.

Volunteers are using two butterfly survey protocols: transect counts (also known as Pollard Counts), and 15-minute counts. To survey a transect, the observer walks along a fixed 1 km route every week during flight season (March to October), and records all butterflies seen within the radius of an imaginary box, 2.5m either side and 5m in front of the observer. Pollard Counts have become the gold standard for butterfly monitoring. In the UK and California (thanks to Art Shapiro), some transects have been walked repeatedly since the 1970s! Survey effort is standardised by length and area under the transect, and so when repeated over time, the method allows robust data analysis. However, there are several situations in which transects may not be suitable. For example, many volunteers would like to record butterflies but cannot commit to walking a regular transect. Some areas are too remote to access often enough, and some climates or terrains are unsuited to the methodology. Fifteen-minute counts were therefore developed as a complementary method, in which effort is standardised by time rather than area. In a 15-minute count, the observer records all butterflies observed inside an imaginary 5x5m box, within fifteen minutes. While recording, the observer can move wherever they like – for example, they can walk along a route, wander in an area such as a meadow, or even sit still on a balcony, for example. A similar method, 30-minute counts, are used in India, and these have been found more effective at surveying butterflies than transects in evergreen forest habitat.



Papilio nireus, blue-banded swallowtail, sub-saharan Africa



Ragadia luzonia treadawayi, Striped ringlet, Philippines

The European Butterfly Monitoring Scheme (eBMS) app “ButterflyCount” was created to record these data, for the European Butterfly Monitoring scheme. It allows users to easily record butterflies as they carry out transects or 15-minute counts, and automatically upload observations to a database. Recently, the app has been expanded beyond Europe, and is now also available for use in Japan and Kenya. With the addition of more species lists, this app will be developed for use across the world – securing funding to taxonomically extend the app for different countries across the globe is one immediate goal for the Global Butterfly Index project. The GBI project is also looking to add the ability to record data from fruit-bait trapping into the app, so that this method can be used to survey for butterflies in the tropics.

For calculating the Global Butterfly Index, the team hopes to build on the methodology used for the EU's Grassland Butterfly Index. This index tracks changes in grassland butterfly populations across Europe, using over 6,200 transects from both schemes that are long-running and those that are very recent. The method has been proven robust and credible enough to be adopted by the EU as an indicator of the status of grassland butterfly diversity and abundance. Work to also incorporate 15-minute counts into the indicator is planned. However, before any Global Butterfly Index calculations are started, the first step will be to gather data, especially from the tropics and Southern Hemisphere.

The Global Butterfly Index project team has been compiling a database identifying monitoring schemes around the world. We have set up a Butterfly Monitoring sub-group within the IUCN Butterflies and Moths Species Survival Commission, with the aim of bringing people together to share data, expertise, and techniques. We will also be hosting a symposium at the Biology of Butterflies conference in Prague (July 2023), to raise further awareness of the project.

This year, we are also focusing on an initial stepping stone target: gathering enough data to contribute a butterfly indicator to the 2024 Living Planet Index. Compared to the previous attempt to include butterflies in the Living Planet Index, the goal is more feasible now, as we have more staff time to work on the project, and better networks.

These steps will also contribute to creating a network for the longer-term goal of creating a separate Global Butterfly Index. The key priority for this goal is finding funding: for creating a database, expanding the eBMS app globally, and developing the methodology to calculate the Global Butterfly Index using multiple survey methods. Eventually, we also hope to help begin citizen-science butterfly monitoring schemes in countries that currently do not have any.

Existing indices, such as the EU Grassland Butterfly Index, would not be possible without the valuable input of thousands of volunteers, and the Global Butterfly Index will be the same. If you want to get involved with monitoring butterflies in the USA, there are many different groups running transects and other types of survey which are looking for volunteers. You can find out what is happening in your state on the North American Butterfly Monitoring Network website (<https://www.thebutterflynetwork.org/monitor-tracker>), and contact the organisers to get involved. If there is nothing available, starting your own butterfly monitoring network or transect would be incredibly helpful. If you would like to be involved otherwise with the Global Butterfly Index project, please feel free to contact me.

For those already conducting butterfly counts, we encourage all to *also* share your count data with organisations that allow free and global access to your data. We are in the midst of a biodiversity crisis—time is urgent—having more data available to more workers will do more to serve nature.

As more states and more countries around the world begin butterfly monitoring, we will gain a clearer understanding of butterfly population change and where to direct conservation action, and be able to establish insect conservation in global biodiversity policy.

For additional reading, see:

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WWF (2022) *Living Planet Report 2020 – Bending the curve of biodiversity loss*. <https://www.zsl.org/sites/default/files/LPR%202020%20Full%20report.pdf>

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Announcements, continued

Continued from p. 40

Lepidoptera Course August 4–14th, 2023 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: \$1,750.

Email swrs@amnh.org for an application, or contact Chris Grinter at cgrinter@calacademy.org for more information on the course.

Searching The Lepidopterists' Society Season Summary on SCAN

Brian Scholtens and Jeff Pippen

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

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

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

Lep Soc Statement on Collecting

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

The Marketplace

IMPORTANT NOTICE to ADVERTISERS: If the number following your ad is "644" then you must renew your ad before the next issue if you wish to keep it in the Marketplace!

Publications, Books

Before closing, Bioquip donated some books to the Lep Soc. The following is a list of titles available. The cost reflects the cost of the book plus \$5.00 shipping/mailling cost (for each item). Please contact Kelly Richers at kerichers@wuesd.org to inquire about availability and purchase.

- D'Abrera, Butterflies of South America \$25.00
- D'Abrera, Butterflies of the Holarctic Region, vol. 5 part 1 \$130.00
- D'Abrera, Butterflies of the Holarctic Region, vol. 5, part 3 \$125.00
- D'Abrera, Butterflies of the Neotropical Region, Pt.1, Revised \$158.00
- D'Abrera, Butterflies of the Neotropical Region, Pt.2, Reprint \$163.00
- d'Abrera, Butterflies Afrotropical Region, Revised, Part 1 \$145.00
- D'Abrera, Butterflies of Ceylon \$20.00
- D'Abrera, World Butterflies \$20.00
- Collected LeConte Papers on Entomology, vol 1 \$20.00
- Collected LeConte Papers on Entomology, vol 2 \$20.00
- Collected LeConte Papers on Entomology, vol 3 \$20.00
- Collected LeConte Papers on Entomology, vol 4 \$20.00

- Collected LeConte papers on Entomology, vol 5 \$20.00
- Collected LeConte papers on Entomology, vol 6 \$20.00
- Collected LeConte papers on Entomology, vol 7 \$20.00
- Collected LeConte papers on Entomology, vol 8 \$20.00
- Collected LeConte papers on Entomology, vol 9 \$20.00
- Collected LeConte papers on Entomology, vol 10 \$20.00

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Southeastern Arizona Butterflies, by Rich Bailowitz and Jim Brock, 356 pages.

This guide is an updated sequel to the ground-breaking 1991 guide by the same two authors. This new work treats in depth all 273 species recorded in the region. It features more than 700 excellent color photographs, most of living butterflies photographed in the field. It provides more than 300 regional larval host plant records. Plus, it features color images of common nectar sources, caterpillars and habitats, range maps for all but the most common and widespread species, and an illustrated comparison guide to the difficult-to-identify duskywings.

Available from Amazon, Barnes and Noble, Discoverbooks, Thriftbooks, etc.

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

We now accept ads from any credible source, in line with the New Advertising Statement at the top of this page. **All advertisements are accepted, in writing, for two (2) issues unless a single issue is specifically requested.** All ads contain a code in the lower right corner (eg. 564, 571) which denotes the volume and number of the **News** in which the ad first appeared. **Renew it Now!**

Note: All advertisements must be renewed before the deadline of the

third issue following initial placement to remain in place.

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

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

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

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

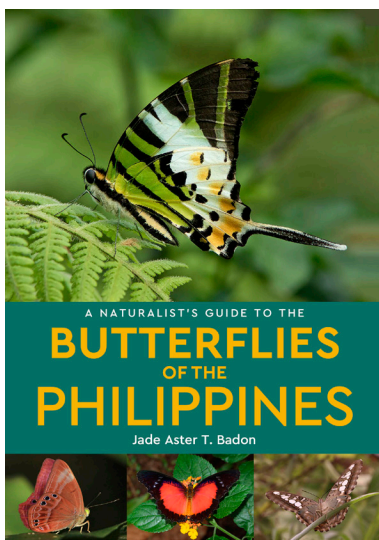
FOR SALE: JOURNALS: 1. COMPLETE SERIES - Journal of the Lepidopterists' Society: 1947- 1998 (Vols. 1-52) including 1971 supplements - \$475 (including shipping). 2. COMPLETE SERIES - Journal of Research on the Lepidoptera: 1962 - 1997 [2000] (Vols. 1 - 36) \$350 (including shipping). Only the complete series of issues are for sale, not individual issues. Payment in installments acceptable. Kindly contact by e-mail if questions arise.

Thanks and best wishes, Glenn A. Gorelick
butterflyguy44@verizon.net

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A Naturalist's Guide to the Butterflies of the Philippines

by Jade Aster T. Badon.
Jean Beaufoy Publishing, 11 Blenheim Court, 316 Woodstock Rd., Oxford OX2 7NS, UK; johnb@jeanbeaufoy.com. £12.99 paperback, ISBN: 978-1-913679-05-7, publication Oct. 2023. 180 x 128 mm (7" x 5"), 176 pages, 300 photographs.



This easy-to-use identification guide to the 289 butterfly species most commonly seen in the Philippines is perfect for resident and visitor alike. High quality photographs from the Philippines' top nature photographers are accompanied by detailed species descriptions, which include nomenclature, wing size, larval foodplant, distribution and habitat. The user-friendly introduction covers species and subspecies, butterfly observation, areas to visit, some butterfly facts, identification and taxonomy, and a glossary. Also included is an all-important checklist of all of the butterflies of the Philippines with their current global status and endemism.

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Equipment

WANTED TO BUY: Genitalia vials/stoppers. Formerly BioQuip catalog number 1133A; 4 x 10 mm plastic vials, w/stoppers, in units of 100 vials/stoppers per bag. Please send quantity and price information to: Terry Harrison, nosirrah@consolidated.net.

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Research

WANTED: For trade or purchase, papered specimens of *Phyciodes* and *Anthanasia* (from anywhere) for a study of phenotypic and morphological variation of Saskatchewan *Phyciodes*. 5-10 exemplars per population would be desirable. I have a limited number of specimens for trade, primarily from Western Canada. Please contact Dr. Daniel Glaeske at dm936@usask.ca.

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Canadian Wildlife Service, Prairie Region, is seeking information about observations of four species: *Melipotryia immortua* (any obs); and *Notamblyscirtes simius*, *Hesperia pahaska*, and *Amblyscirtes osleri* (any obs from Canada, MT, ND or MN). Data will be used to help identify potential habitats and locations for future Canadian surveys and to assist with determination of Canadian at-risk status. Detailed locations do not have to be shared. Please contact Medea Curteanu, CWS Edmonton, AB; medea.curteanu@ec.gc.ca

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WANTED: Hawkmoths for Research. Hawkmoths can drink liquids with very different viscosities, from water to honey. We seek to understand how this is accomplished. We are requesting hawkmoths (Sphingidae) of any species (non-threatened, non-endangered species only) from Arizona, California, and New Mexico. We request dry adult hawkmoths carefully packaged to avoid broken appendages or damaged wings. We will pay shipping costs. Proboscis images will be posted on our website, and all contributors will be acknowledged.

Contact me, Alex (Alexandre Varaschin Palaoro), to arrange shipping (e-mail): avarasc@clermson.edu.

Website: <https://cecas.clemson.edu/kornevlab/>

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Research Help: I am a faculty member in the chemistry department at Portland State University conducting research on the life cycles of the several distinct populations of the spotted tussock moth, *Lophocampa maculata*. I would like to find one or more members living along the coast of California between roughly Los Angeles and San Francisco who are familiar with this species in their area and would be willing to help my research efforts. Please contact me if you can help my project. I can provide greater detail and information on material I am in need of. Email me at kstrot2@pdx.edu. Kenneth Strothkamp.

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Berthet, Butterflies of Veracruz, references

Continued from p. 37

Internet and Literature Consulted

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Everythingreptiles.com -- Mexican Black Kingsnake
Mapcarta.com Rancho El Atoron Map-Veracruz Mexico
Wikipedia.org/wiki/Veracruz
Wikipedia.org/wiki/Xalapa

Wash ashores include fluttering beachcombers

Tor Hansen

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Birders confirm oceanic birds by scanning the horizon with binoculars, and even lug a spotting scope and cumbersome tripod to locate the feeding flock and elusive King Eider Duck. But to locate the fleet specks (butterflies) that flutter over vast ruffled swells takes awareness and keen eyesight to determine that they are more than turning leaves.

"Oh there is your bird, and It is likely to be a Horned Grebe". But what is this wind driven dark leaf hurling along? Standing at the edge of the sunlit Atlantic Ocean here in Truro, Cape Cod, with feet washed by a gentle surf, I search the shoreline for offshore "turning leaves", that turn out to be literally mad dashing Red Admiral butterflies. Or shall we call them by their original anglo-name with fewer letters derived by the way they fly -- "flutterfys", even "flutterbys"?

With eyes trained to pick up these flutterfys barreling inshore about 6-10 feet above sea level, I sense a passing flush of whirling wings that sounds close by like rustling cray paper. Each admiral dashes by singly, not in a flock or paloma, and not in follow the leader single file style. Sometimes many minutes pass between admirals passing. They cross who knows how many miles of open water? Such drive and stamina is to be respected and admired given the enormous energy required to make such an adventurous crossing. And originating from where?

Turning to pick up its trail I scan the tall glacial headland at Long Nook beach, and follow the speck as it zooms up the 100 foot scarp and disappears into the scrub oak

canopy. They can meander up (as in fig. 1) or dash straight up and over. At first one may ask "A scrub oak canopy is stunted by harsh cold wintery winds, so what nourishing elements can they obtain there?". I will summon my hover craft and follow them to where they plunge into green leaves below! Don't I wish... if they would be that easy to locate in a sometimes impenetrable thorny thicket! With great care not to dislodge the tender wildflowers and crusty ground cover comprised of bearberry, twin flower and even broom crowberry, I am forced to crouch and crawl under outstretched sharp cat briar vines. Once inside the entangled thicket of stunted oak and beech canopy, one can search for hours without a clue to find a roosting butterfly. Luckily one can proceed unimpeded by staying to the bridle trails where horses carry riders out to explore the dunes and wade into the surf where hooves splash in brief exhilaration, where deer have worn intersecting pathways through the downs. Beach Plum blooms, ephemeral early in May, along woodland edges and in old thickets across sunny glacial sand plains, where it is host to thirsty angle wings and Vanessa ladies. (fig. 2).

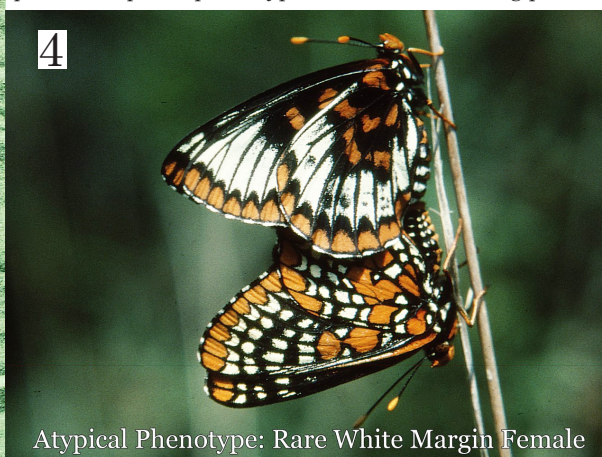
Consider the stranding of 44 Baltimore Checkerspots and two Red Admirals in 1990 washed ashore along Truro Atlantic tidelines likely due to thick fog that morning in late June, with windy chop of two to three feet. As fog had lifted, I picked up several still alive yet feeble, unable to fly (fig. 3). Baltimores appear to vanish suddenly from a local milkweed and lanceolate plantain colony, so they may have been caught outward bound as a group. But it is hard to say if these Red Admirals were also exploring "new"



Fig. 1. Red admirals onshore flight to glacial highland sap. Fig. 2. Question Mark imbibing at beach plum.



Fig 3. 44 Baltimores & 2 red admirals recovered from standings along Truro Atlantic tidelines. Fig. 4. Rare *E. phaeton* *superba* phenotype in Baltimore mating pair.



habitat, perhaps indeed caught while fluttering inshore. After this stranding I searched Truro's Twinefield Meadow and found a colony there numbering in the hundreds, including a rare aberrant form *E. phaeton*, "*superba*" (fig. 4; Strecker, 1878). For more see my article "Of Mystery and Migration" in "The Cape Naturalist", Cape Cod Museum of Natural History, June 1990.

Fast forward to the Provincelands, CCNS, the outskirts of Provincetown, where wind driven sands have drifted into high dunes allowing lowland dune swales, where a unique flora occupies interspersed valleys. Close to the aquifer where roots have access to fresh water, an array of wild flowers have sprung up and flowering shrubs as well, like alder, blueberry, winterberry, serviceberry, honeysuckle, huckleberry, water willow, beech plum, and wild cranberry. These enduring perennials can outline kettle ponds and wetlands as well, providing exceptional nectar for the the imbibing denizens. Wear knee high boots to stay dry and avoid invasive poison ivy and mosquitos with intent to stay while observing how species utilize natural resources. Coinciding with a hatful of Red Admirals that crossed unknown miles over ocean to ascend the headlands, a single huckleberry can host a dozen or more thirsty Admirals fluttering from blossom to blossom. The presence of *Vanessa*

atalanta can occur in boom or bust alternating years, considering their larvae depend upon nettles that are scarce across Cape Cod. Thus even in full bloom a huckleberry during ghost years can draw not one red admiral to dine on its nectar. (Figures 5-7)

A flurry of insects, namely flies, beetles, ants, bees & wasps, also seek nourishing fluids, extracting sap oozing from hardwood stems inside the umbrella-like shelter of an oak and cherry canopy. Where higher ground supports an interloper, Tartarian Honeysuckle (*Lonicera*) grows in wild sprawl, displacing native beach plum. Of great concern to



Fig. 5. Red Admiral imbibing at Honeysuckle. Fig. 6. Red Admiral sucks nectar at Huckleberry. Fig. 7. Another Red Admiral finding nectar at Huckleberry blossom.



Fig. 8. Windswept dunes allow dune swales to support skirted oaks that provide sap for butterflies.

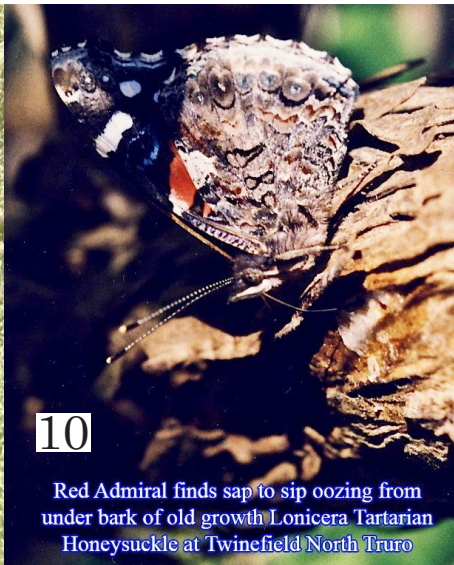
locals who love to gather ripe beach plums and make the famous beach plum preserves, can slow growing beach plum outlast the *Lonicera* surge? Wide *Lonicera* bushes reach 15 feet across and the same in height. With shaggy bark trunks some can measure 4 inches in diameter. The old growth of 15 to 20 years still offers sap where Red Admirals abound. Here they may roost, hill-topping to find a prospective mate on the fly. Wasps in particular with stout chewing mandibles to get through tougher bark, can open wounds and direct access to the moist cambium and phloem layers inside. Observe their antennae a'twitter, detecting where aqueous reserves are palpable. Inside the entangled thicket, Red Admirals appear attracted to these open wounds, that emit fragrant molecules possibly deciphered by specialized sensory cells in their feet and antennae! Here they quaff their thirst sucking up sap, rich in nutrients and natural sugars, likely fructose. (figs. 8-12)

Like other wasps and hornets, Yellow
Jackets have sharp mandibles...

9



jaws capable of chewing and
opening wounds making sap wells
for other insects



10

Red Admiral finds sap to sip oozing from
under bark of old growth *Lonicera Tartarian*
Honeysuckle at Twinefield North Truro



11



12

Fig. 9. Yellow Jacket wasps can open wounds allowing Red Admirals access to Tartarian Honeysuckle sap. Fig 10. A Red Admiral secures sap at Tartarian Honeysuckle. Figs. 11 & 12. Red Admirals discover sap at Tartarian Honeysuckle, along with beetles and yellow jackets.

Hot summer sun has generated a special phenomena exemplified in a patchwork of skirted cherry, oak and pine, that proliferate throughout the shifting sand dunes (fig. 8). In their effort to avert desiccating sunshine, their profiles reveal ever-changing shape and form as elemental earth forces drive sand grains to tumble and lodge in the skirted branches touching the ground. These dune-hearty hardwoods adapt by growing a widespread skirt of bushy branches shielding the sand and thus shading and cooling underground roots. Each skirted hardwood adds to the height of its own immediate dune. Restless dunes are windswept as they

are driven to spuriously cover older oaks and exceed ten vertical feet sometimes smothering lower branches leaves and all. This unique habitat calls for serious study, so to witness evolution in action.



Fig. 13 & 14. Mourning Cloak imbibes sap from scarlet oak. Fig. 15. Life cycle of Mourning Cloak, showing eggs, larva, pupa, adult emerging from chrysalis. Fig. 16. Mourning Cloak emerging with two part, divided proboscis. Fig. 17. Proboscis emerges in two halves and needs to fuse into one complete hollow tube. Fig. 18. Proboscis aligning for fusing into one whole sucking tube. Fig. 19. Proboscis in final fusing of its two halves in persistent flexing.

Approaching a red oak may scatter the hill topping angle wings. An extended stay for the observer will lead to invaluable eco-notes on how they thermoregulate and beat the heat, outlast protracted rains, and survive long cold windy winters.

The butterflies find rows of oaks that over time continue to grow into a long dune edged like a sheltering bulwark, protecting a flourishing dune swale in the leeward side where wind does not disrupt the sanctuary within. Here they find energy rich sap within the shaded oasis. Watch the mourning cloaks and question marks that flutter up and vanish under a canopy (figs. 13-14). So as not to scare them from their objective search for sap, with slow motion duck under the umbrella, and follow the species probing

and palpitating with a flexible proboscis. They appear to pierce the bark to sip sap from the cambium / phloem layers within, but how can such a nimble flexible proboscis act as a drill? Where sap is near the surface three species can be seen side by side imbibing sap (Question Mark, Mourning Cloak, Red Admiral), as well as other insects, where bees may play a central role because they deploy their stout jaws to open easy access to sap. So remarkable is how adult butterflies shortly after emerging from the chrysalis must fuse the two-part proboscis; the altogether new proboscis is unwieldy, at first arising in two equal pieces, like a garden hose sliced down the middle. The butterfly has the means to fuse the hollow tubes in repeated flexing into one functioning proboscis! (figs. 15-19).

Where have all the Red Admirals gone? They join their fellow species in search of life-sustaining sap in the harsh dune lands, and utilize nectar producing wildflowers proliferating in dune swales, and flutter across Cape Cod intent to secure nettles for their larvae in remarkable outreach. Dune swales sustain milkweed, goldenrod, knapweed, high-bush blueberry, and purple loosestrife. This latter offers copious nectar, and is to be left in place for hairstreaks, monarchs, hummingbird moths, silver-spotted, and broad-winged skippers, where loosestrife mingles with the latter's larval host plant *Phragmites*. Here and again where extensive salt marsh mingles with the fresh water aquifer, purple loosestrife provides energy for dark form broad winged skippers that resemble the little mulberry wing skipper. Is this possible that the two exist here? Browsing the collection at Peabody Museum Yale New Haven, I did trace the similarity in phenotypes showing both lighter and darker phenotypic variation with intergrade shadings among broad wings, including smaller dark ones in scale suggesting little mulberry wings!

Is there more to oak resources than umbrella shade and phloem sap? For a flutterfly oh yes; growing acorns apparently provide fast energy. Predominant oaks rooted in the sandy soils of these dune lands are at least three species: Black, Red, Scarlet, and Scrub Oaks. Some oaks are known to hybridize and the deeply invaginated leaves of many suggest scarlet rather than red. Scrub oak adapts very well to sandy soil, and on Cape are host to larvae of Edward's Hairstreak, Polyphemus silk moth, and Buck Moth with their urticating larvae. If one can locate an

Edward's egg that overwinters on the rough twig below the leaf bud, one should receive a special prize! (like a free copy of my book "Butterflies Across Cape Cod", Mello & Hansen; Patriot Press).

Follow the red admiral as it dips down into a canopy of wind tossed leaves, and focus on the young acorns growing in clusters. Before long one sees a Mourning Cloak or Question Mark or American Lady working its proboscis into the nooks and crannies of assorted acorns. They extract moisture and likely some sugar rich fructose inherent in the sap. How so narrow a tube can siphon nectar and sap through so small a diameter is astonishing. Dilator muscles in the head, much like a turkey baster pull liquid sap through the remarkable but narrow tube. A good word can be said for previous research on viscosity of nectar estimated at about 23- 27% solution, that allows transport of nectar to flow easily through the proboscis (back issue Scientific American). (figs. 20-23).

Recall that the larvae have calcified stout mandibles for chewing foliage, in the larva stage only, and they are lost completely in the metamorphosis. Associated tissues in the adult flutterfly have been modified into a totally new tool for sipping. Yet they accomplish it innately! Over evolutionary time the proboscis has proven effective, despite the host bending upside-down in innovative extra effort. One photo reveals the mourning cloak inserts the proboscis into a seam between oak leaf petiole and woody stem. In a sense these acorns provide fluids like a canteen at an oasis, perhaps like a sacred amphora of ancient

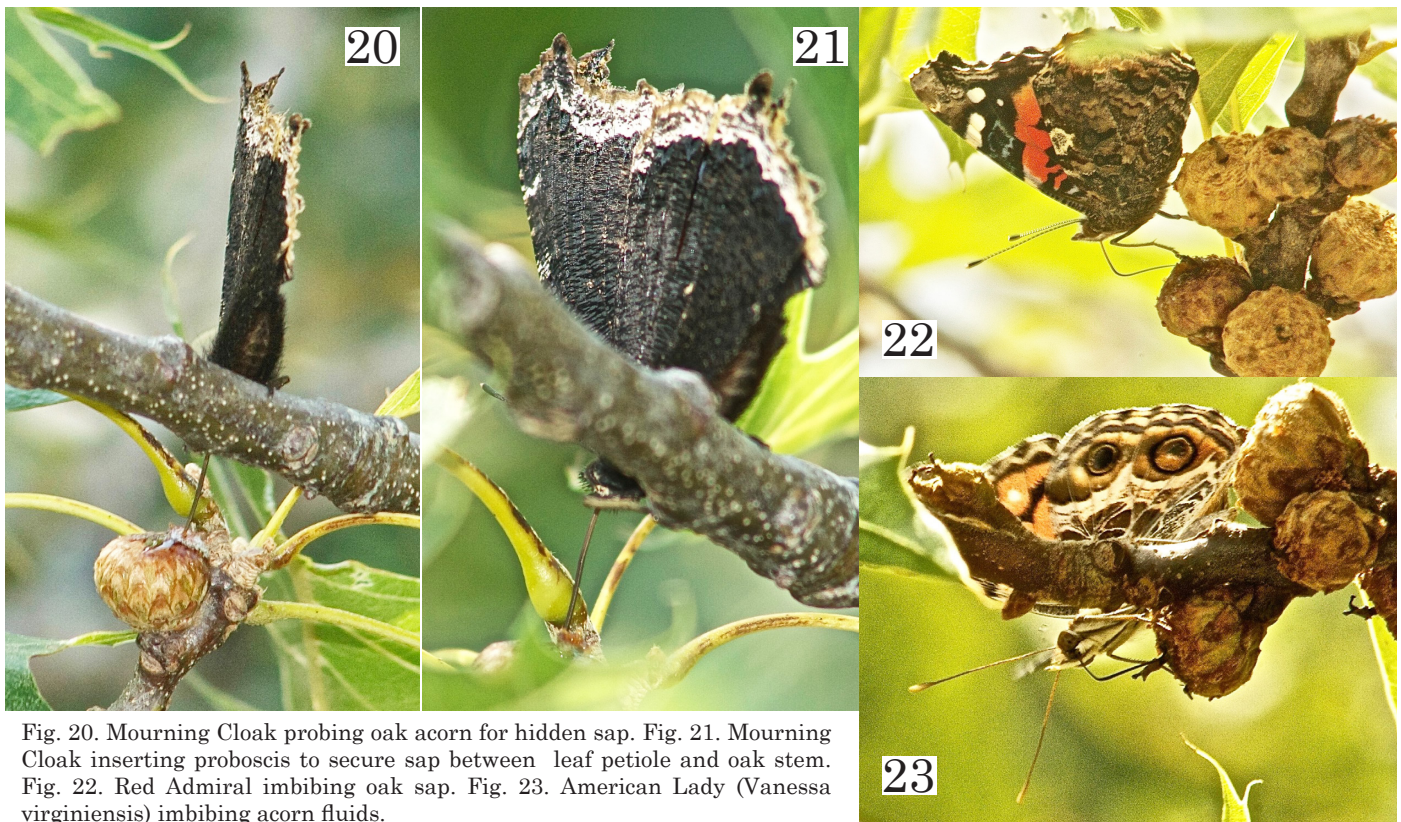


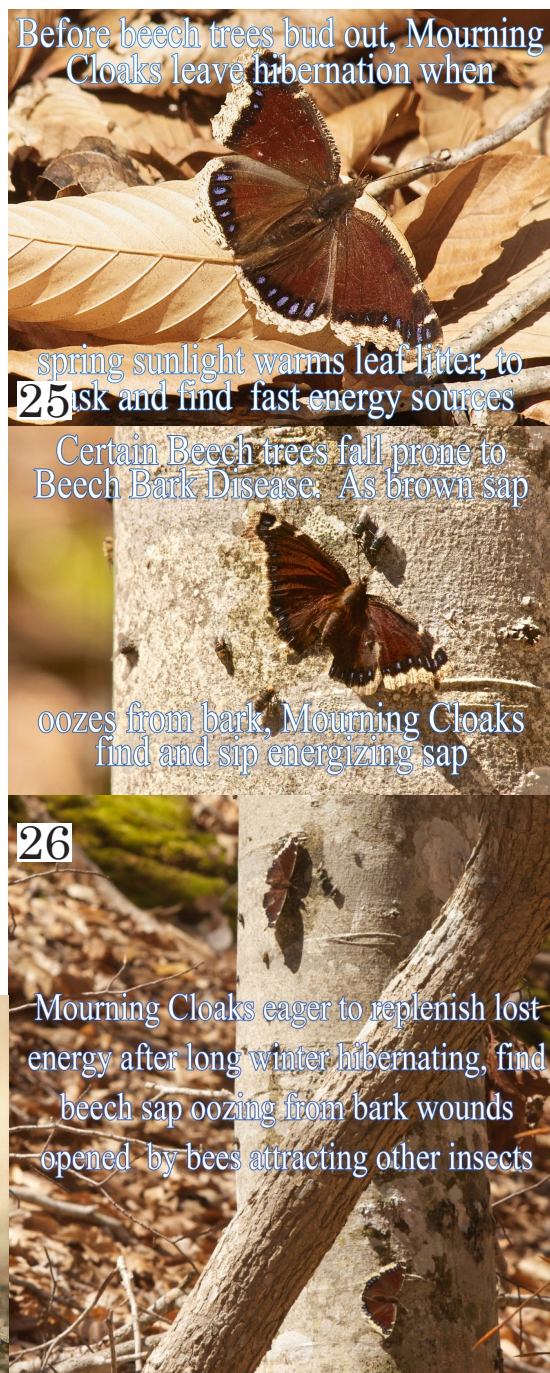
Fig. 20. Mourning Cloak probing oak acorn for hidden sap. Fig. 21. Mourning Cloak inserting proboscis to secure sap between leaf petiole and oak stem. Fig. 22. Red Admiral imbibing oak sap. Fig. 23. American Lady (*Vanessa virginiensis*) imbibing acorn fluids.



civilizations that carried water or wine and stored food for the long journey. At a glance evolution of the proboscis enabled butterflies to puddle for ground water and minerals likely before the flowering plants (angiosperms) arose to offer nectar. If the fluttering insect gives something to promote the acorn's growth, there may well be a hidden symbiosis here underlying this co-evolution of oak and butterfly.

When a breath of springtime caresses the woodlands, the harbingers emerge from the leaf litter. As gentle breeze and prolonged sunshine warm the ground story in Beech Forest, signs of spring enable early birds to come out of hibernation. Angle wings include Mourning Cloak, Question Mark that overwinter as adults; they are joined by some lycaenids like Spring Azure and elfins that emerge early. Where beech trees thrive especially at head of the horseshoe trail around Beech Forest Pond (small lake), watch what fluttering wings rise above the dry beech leaves that cover the ground. Eagerly they search for sources yielding fast energy like beech bark that encircles the energy-rich sap inside the cambium/ phloem layers, just inside the gray smooth bark. But not all beeches yield sap alone palpable by the deployed proboscis. Search for the beech trees for those afflicted with Beech Bark Disease, oozing brown fluids, where flies gather to sip, and bees with their sharp jaws further make sap accessible. Wikipedia research reveals that wooly beech scales attack certain beeches, genus *Cryptococcus*, and allow fungi (*Nectria* species) to enter an open wound. Some of our grand daddy beeches around the Cape (and Wareham) show such streaming infections, and one wonders can forestry find a cure and prolong their awe-inspiring lives? Do these harbingers build up disease resistant immunities? Here despite this threatening disease, Mourning Cloaks imbibe what sap they can ingest, and this fountain may suffice them for a while before a chilling snow storm chases them down under the leaf litter again until the late snowfall melts away. (figs. 24-27).

Fig. 24. Mourning Cloak basking in warm leaf litter at Beech Forest. Fig. 25. Mourning Cloak sips beech sap from diseased beech tree. Fig. 26. Mourning Cloak imbibes beech sap at wounds opened by other insects. Fig. 27. This one Red Admiral Puddling might compliment the age old possibility that imbibing minerals and fluids from the ground may precede imbibing nectar at flowering plants - angiosperms.



***Satyrrium* hairstreak “bimodal” adult emergence. Observations of *Satyrrium ilavia* (Beutenmuller, 1899); spring adults in May and adults in September 2022**

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Satyrrium ilavia, first sighting, September 6.

Beginnings:

On an afternoon the first week in September I was headed for home in Tucson, driving thru Oracle Arizona; so, I stopped at a known hairstreak spot. A few hairstreaks were there, the expected grays (*Strymon melinus*) and great purples (*Atlides halesus*). But then I was shocked to see a *Satyrrium ilavia* too (Fig. 1)! I netted the nice male, just to make sure what my eyes were telling me. I quickly contacted a few butterfly folks and reported the find. Most everyone seemed surprised.

Why the excitement? Its because *S. ilavia* is a *Satyrrium*, a univoltine (single flight) butterfly that diapauses thru the latter

part of summer, fall, and winter as an egg, ends the obligate diapause in early Spring, hatches and passes thru to pupae in March-April; ecloses and as an adult flies in May (Oracle Arizona). But months later in SEPTEMBER? What is going on? This must be an aberrant fluke I presumed. BUT this story gets even more interesting!!

Rewind:

Look back to LepSoc News, “Observations in southern Arizona of hill topping *S. ilavia* Hairstreaks: Spring 2017”. This article discusses the flight and adult behaviors seen in a southern Arizona colony of *S. ilavia*. Timing and behavior align with expected *Satyrrium* typical life cycle and as described in many field guides. A *Satyrrium ilavia* male exhibiting strong normal *Satyrrium* mate finding behavior, tree/hill topping, was documented.

Spring of 2022 (Plate 1) was quite typical for this local *S. ilavia* colony. After eight spring outings I had Arizona *S. ilavia* sightings near Oracle, Pinal Pass, and near Globe. Dates were from May 9th to June 5th. The flight window closed with adult sightings ending.



May 12



May 22



May 24



May 26



May 29

PLATE 1:
SPRING 2022
SIGHTINGS



Fig. 2. *Ilavia* hairstreak sighting locations near Oracle Arizona, September, 2022

September 2022:

So now September.... After the unusual sighting I thought about it for a couple days, and you know what, I had to look some more! My first inclination was to visit my known hilltops (shown in the 2017 article); I did, and I was **ENTHUSIASTICALLY** surprised as I found more *S. ilavia* hairstreaks, quite a few more. At first sightings were male *S. ilavia* on treetops, but later I found several *S. ilavia* females hanging out on their scrub-oak host, *Quercus turbinella*.

The sightings were spread across a 3 mile transect at different locations (Fig. 2). Over four different outings I sighted nine different adults: September 6th until my last

sightings on September 14th (Plate 2). While this seemed a short window, I may have missed the beginning of the flight.

“WHAT WAS THIS?”. OK, so this wasn't a singleton one-off happening....it was something else with significant butterfly investment. I have NO answers, but the following are a few intrigues I found that you might consider when forming your own conclusions!

Literature Search:

Do we postulate that this was a “one time only” bimodal emergence, or is it a reoccurring situation? Has the behavior existed and been documented?



Sept 9

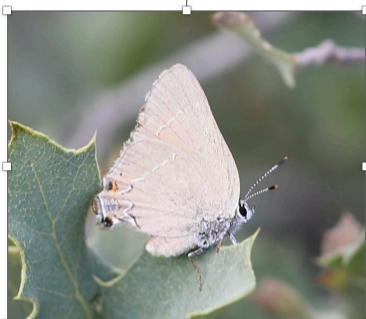


Sept 11



Sept 12

PLATE 2: SEPT 2022 SIGHTINGS



Sept 14



Sept 14

Looking at online data I can find no other *Satyrrium ilavia* sightings with September (or later or earlier August) records. Latest I found was July 3, 2017 Prescott Arizona. (<https://bugguide.net/node/view/1405900>).

This information did not show any bimodal situations, so I looked “farther back” at other similar hairstreaks. After all, *S. ilavia* is closely related to other oak hairstreaks as you can find in the phylogeny work. (Zhang et al 2019, Fig. 3).

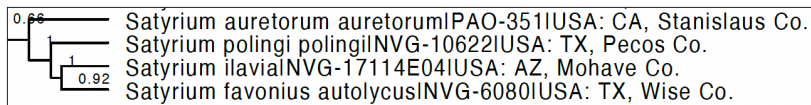


Fig. 3. Relationships of *Satyrium auretorum*, *polingi*, *ilavia*, and *favonius autolytus*; from Zhang, et al., 2019, Genomics of a complete butterfly continent, media-2 (Nuclear genome tree)

Is there something afoot amongst the two *Satyrium* hairstreaks? Something different but common? YES!

S. ilavia (Arizona) and *S. polingi* (New Mexico, Texas, Mexico) live in similar desert ecosystems.

BINGO, I DID FIND several “bimodal” records, for *S. polingi*. So perhaps the *S. ilavia* September observations are not a unique situation. Here is the *S. polingi* hair-streak information I found:

Normal *S. polingi* flight time is May-June.

Martin Reid has a photo of *S. polingi* (“saw 3”) Davis Mtns, Texas September 3, 2011; Martin Reid has another photo of *S. polingi* (“next to Basin store”), Big Bend National Park, Texas September 4, 2011.

<http://www.martinreid.com/Butterfly%20website/leps103.html>; also: Sept 2011 <https://inaturalist.ca/photos/176270696>

S. Carey refers to “second flight” of *S. polingi* in south Texas (2); J. Scott refers to “second flight” of *S. polingi* in south Texas (3).

<https://www.butterfliesandmoths.org/species/Satyrium-polingi> refers to two flights.

And this recorded observation resource:

GBIF records <https://www.gbif.org/species/5714812>

I graphed the GBIF *S. polingi* records that had both latitude coordinates and dates (Fig. 4). *S. polingi* clearly has something going on! Is *S. polingi* exhibiting “Bimodalness” (see 30 degree north below)?

S. polingi is a mid-elevation Chihuahuan desert oak dweller, while *S. ilavia* is found across Arizona in several regions -- “Mojave Basin and Range” near Kingman Arizona (most northern), “Mogollon Transition” (central), and south to “Madrean Archipelago” near Tucson. Notably the ecosystem near Tucson, the Madrean Archipelago, is characterized as “...Apachian Valleys and Low Hills ecoregion is physiographically similar to Ecoregion 24a, the Chihuahuan Basins and Playas found in New Mexico and Texas.” INTERESTING!? The scrubby oak in Chihuahuan Big Bend area is *Quercus grisea* while in the Madrean region it is *Quercus turbinella*. These plants have similarities too.

30-degrees and South: PLANT WEIRDNESS

Now looking into online oak tree literature, I found some interesting information about a (massive) tree behavioral transition at the 30-degree latitude. This is a transition where (temperate) evolved trees normally controlled by temperature in their life cycle phenology, no longer have this consistent temperature signal (it doesn't get cold so much). Those that live in the subtropics have shifted their phenological controls to photoperiod and moisture. (You must read this work “Phenology of temperate trees in tropical climates.” Borchert et al 2005” (4)) The same tree species, but at different places (latitudes), has evolved different signaling. That is weird. Oak trees start using different environmental signals when they pass a latitude of 30 degrees. Imagine that. This just happens to be the latitude of Alpine and Marathon Texas.... central home for *S. polingi* populations in the US! If you depend on oaks, wouldn't this throw your lifestyle a curve?

PRECIPITATION SHIFT

Being close to the US border with Mexico, the climate in the noted locations has a significant precipitation peak in mid-summer (Fig. 5). This “summer monsoon” or wet season is a shift not seen in other temperate US regions; maybe this, too, is a part of the puzzle!? (Austin, Texas, where *Satyrium favonius* is common for instance, has a precipitation peak in late May.)

This summer precipitation peak impacts plant communities, and so perhaps the hairstreak community?

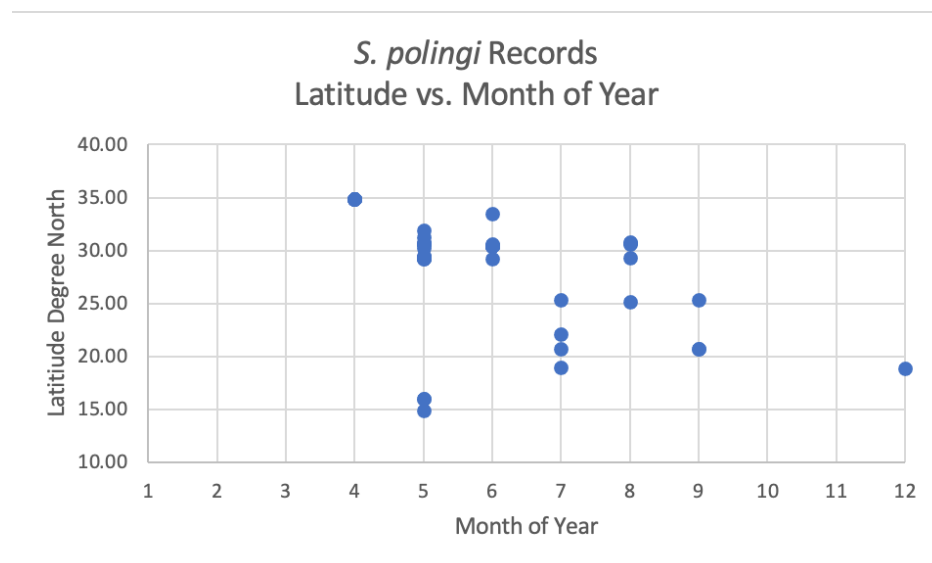


Fig. 4. *Satyrium polingi* records -- latitude (y) versus month of sighting (x)

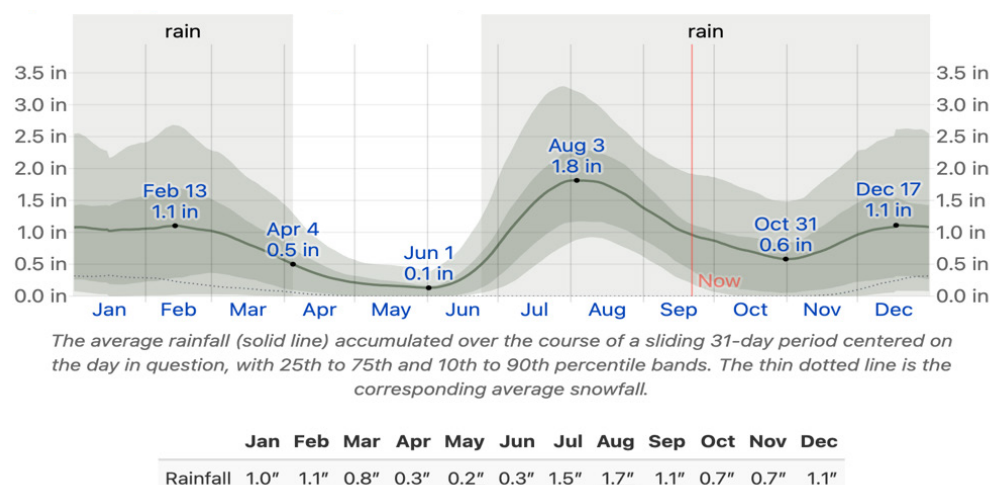


Fig. 5. Average monthly rainfall in the Oracle, Arizona area; information from <https://weather-spark.com/y/2851/Average-Weather-in-Oracle-Arizona-United-States-Year-Round>

Just this summer near Tucson there was a very noticeable growth spurt in *Q. turbinella*, and a very strong second summer bloom of *Senegalia greggii* - Catclaw Acacia (a favored *S. ilavia* adult nectar source). I believe there would be advantage to have adults of the colony take advantage of these resources!

How might this “bimodal” eclosure happen?

There would seem at least two possible scenarios; 1) A delay in some life cycle phase, delaying adults' emergence or 2) A second full life-cycle generation.

Scenario 1:

It seems a partial delay, (e.g., a diapause for some % of the *S. ilavia* pupae population), followed by a release trigger or bioclock time out, could cause the second emergence. This scenario has parallels with other hairstreaks, other butterflies, and even moths. Widely discussed and researched, there are MANY literature references of delayed and staged pupal diapause and termination for instance. It seems not only can environmental conditions create prolonged pupal diapause, but internal genetic triggered “clocks” can drive it independently, too.

Literature Examples:

1. A clear “bimodal” split eclosure strategy for the *Cecropia* moth, genetically based; consistent and separated pupae eclosures (5; 1973, Waldbauer/Sternburg).
2. The early spring *Callophrys sheridanii*'s staged pupal eclosure with the majority eclosing very early in spring but others staged thru the summer (6; 1997, Hiruma/Pelham/Bouhin).
3. *Callophrys gryneus swadneri* in Florida having a narrow and complete pupal stage eclosure; but *Callophrys gryneus gryneus* in Tennessee, a staged pupal eclosure continuing thru summer months (7; 2005, Pence).
4. And western Blue butterfly's very variable and adaptive pupae eclosure

strategies connected with their host plant blooming (8; 1993, Pratt and Ballmer).

Scenario 2:

Many of our hairstreaks (*Callophrys*, also *Strymon*, *Atlides*) have multiple annual generations; they overwinter as pupae which facilitates an early annual start. On the other hand, a *Satyrium* second generation annually has never been documented. *Satyrium* have evolved a finely tuned **annual** plan that precludes shortcuts. All *Satyrium* hairstreaks overwinter as

an egg, with diapause that is obligate. This is a temperate climate survival adaptation for the *Satyrium*. This egg diapause starts after ovipositing in spring and lasts thru fall and winter and has a cold temperature trigger for diapause release. *Satyrium* egg hatching is synchronized with their host tree spring flowering and bud breaking, a necessity for *Satyrium* hatchling food access and survival. This seems an advantage for *Satyrium* to access this special nutritional resource. To double up seems mis-aligned to necessity to utilize host tree phenology correctly, and thusly a scenario of 2nd generation would appear difficult for both climate and host timing. But perhaps not impossible!

Let's get OUT in the field!!

OK I'm done! It's another case of “no one knows for sure”! Another mystery to ponder or investigate! Where do you think I will be early next September? Let's go!

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Additional records of *Chlosyne nycteis* (Nymphalidae) in Maine

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The silvery checkerspot, *Chlosyne nycteis* (Doubleday), has experienced an alarming decline across much of New England, where it is thought to be extirpated in four of the six states in the region. Although it is still present in Maine, records during the years 2011-2021 suggested that populations were confined to the mountainous portions of Franklin and Somerset counties (Calhoun 2022). However, the 2022 season gave reason to be more optimistic. This butterfly was documented at seven new localities in northern and southwestern Maine (Fig. 1), as well as five new localities in Franklin County. These records are an encouraging sign that *C. nycteis* is still widespread in Maine, though very localized and generally rare.

New records. On 11 June 2022, Mike Murphy photographed a single female *C. nycteis* on his property in West Paris, Oxford County (Fig. 5). This is the first known record of this species from Oxford County since the 1860s, when two individuals were captured by Sidney I. Smith in the vicinity of his home in Norway, about eight miles (13 km) south of West Paris. Smith's specimens are deposited in the Peabody Museum of Natural History, Yale University.

Also on 11 June 2022, I found a single male *C. nycteis* in a roadside clearing in Chain of Ponds Township, Franklin County. On 15 June, I recorded *C. nycteis* at four sites in Jim Pond Township of Franklin County, including one roadkill female where I had found evidence of larval feeding in August 2021 (Calhoun 2022). At one of the sites in Jim Pond Township, about a dozen adults were observed in a flowery clearing and along an adjacent gravel road (Fig. 2). On 21 June, I located a colony in northern Chain of Ponds Township, where 10-12 adults were frequenting weedy openings within mixed spruce and hardwood forest (Fig. 3). This trail crosses into Coburn Gore, the northernmost township in Franklin County. I found two females inside Coburn Gore, feeding on orange hawkweed (*Hieracium aurantiacum*), a favorite nectar source of *C. nycteis* in Maine.

While working on the Maine Bird Atlas project, Jeff Cherry photographed a single male *C. nycteis* on 23 June 2022 in northern Aroostook County, in the unorganized township of T14 R5 WELS. Only one previous record was known from Aroostook County; in 1995, when nine individuals were collected by Ronald Rockwell in the extreme northwestern corner of the state (specimens in the Carnegie Museum of Natural History). I visited

the new Aroostook County locality on 29-30 June 2022 and observed several adults (Fig. 6) along a gravel road through mixed forest with scattered openings. I also found a few individuals along a weedy trail, about 1.5 miles (2.4 km) farther north in the same township (Figs. 4, 7). Earlier that morning, I encountered three *C. nycteis* at two other sites in Aroostook County, about 32 miles (52 km) farther south in the unorganized township of T9 R5 WELS (Fig. 8).

On 26 June 2022, Phillip deMaynadier recorded *C. nycteis* at two localities in northern Piscataquis County, in T7 R10 WELS (Fig. 9). These are the first records in Piscataquis County since 2004, when Gail Everette captured one worn male and observed another about 30 miles (48 km) farther south in T2 R10 WELS (Maine Butterfly Survey database).

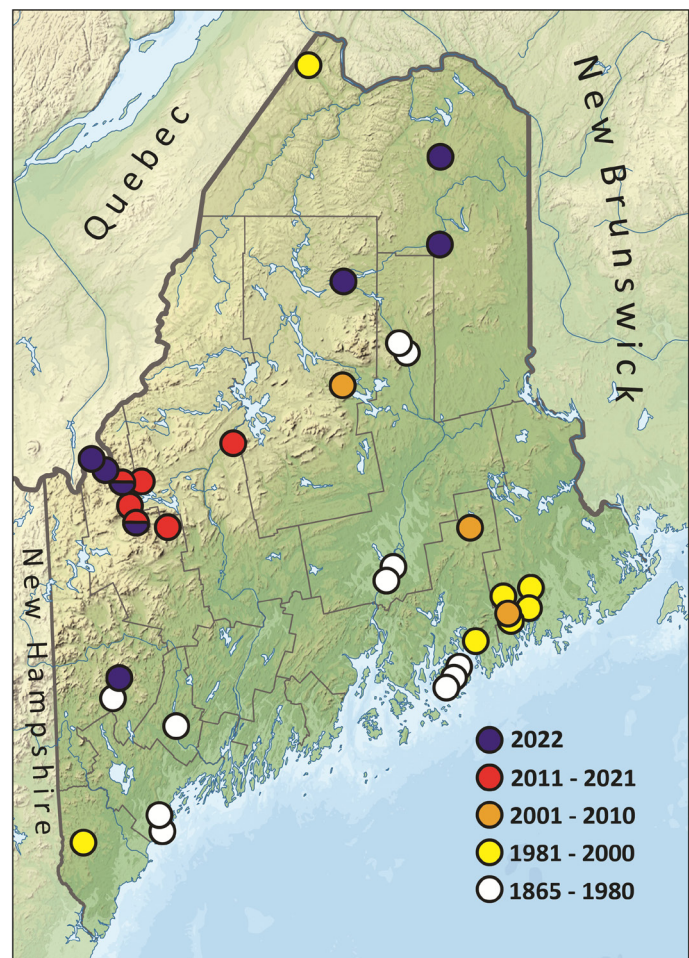


Fig. 1. Map of known Maine records of *C. nycteis* (by township) from Calhoun (2022), with the addition of those from 2022.



Figs. 2-12. *Chlosyne nycteis* and habitats in Maine, 2022. **2**, previous timber staging area with abundance of hawkweeds, 15 June, Jim Pond Township, Franklin Co. **3**, trail through weedy opening created by logging operations, 21 June, Chain of Ponds Township, Franklin Co. **4**, old logging trail through mixed forest, 29 June, T14 R5 WELS, Aroostook Co. **5**, female, 11 June, West Paris, Oxford Co. (M. Murphy). **6**, Female, 29 June, T14 R5 WELS, Aroostook Co. **7**, female, 29 June, T14 R5 WELS, Aroostook Co. **8**, female, 29 June, T9 R5 WELS, Aroostook Co. **9**, male on coyote scat, 26 June, T7 R10 WELS, Piscataquis Co. (P. deMaynadier). **10**, male, 11 June, Coplin Plantation, Franklin Co. **11**, female, 15 June, Coplin Plantation, Franklin Co. **12**, courting pair, 28 June, Coplin Plantation, Franklin Co.

In addition, I revisited three localities in Coplin Plantation, Franklin County, where I had found *C. nycteis* in 2021. Only a few adults were observed on 11 June (Fig. 10), 15 June (Fig. 11), 28 June (Fig. 12), and 7 July. The highest total was only five, on 11 June, at a site where dozens were observed on 13 June 2021. As expected, their numbers were significantly lower in these areas than in the previous irruption year.

At many of the new localities, including those in Oxford and Aroostook counties, large-leaved wood-aster, *Eurybia macrophylla* (L.) Cass., grows nearby. This aster was identified as the food plant of *C. nycteis* in Franklin County, Maine, in 2021, and it may serve as the primary host throughout this portion of the butterfly's range (Calhoun 2022). I found *E. macrophylla* to be extremely common at one of the *C. nycteis* localities in Aroostook County, where thousands of plants formed extensive patches.

Why Maine? It is difficult to explain the continued presence of *C. nycteis* in Maine, while it is very rare or extirpated elsewhere in New England. This species was always thought to be scarce in Maine (Calhoun 2022), but the paucity of reports between 2004 and 2020 suggested that it was headed down the same ill-fated path as elsewhere in the region. However, this species appears to be thriving in Maine, if only temporarily.

It seems counterintuitive, but my observations suggest that populations of *C. nycteis* in Maine are benefiting from timber harvesting. With nearly 18 million acres (7.3 million ha) of forested land, Maine has the largest percentage of forest coverage of any state in the nation (83%), and more than 400,000 acres (161,874 ha) are treated to cutting annually (USDA 2020). Most of the records of *C. nycteis* in Maine over the past decade have been associated with clearings and trails that were created by lumbering operations. If not too extensive, these activities encourage the spread of larval food plants, and previous staging areas for loading harvested logs often become overgrown with wildflowers, including orange hawkweeds (Figs. 2-4). The resulting boost in food plant and nectar source availability

creates the perfect habitat for *C. nycteis*. A patchwork of such ephemeral colonies, linked by roadways and trails, form larger metapopulations. Local irruptions, like that of 2021 in Franklin County, presumably hasten the expansion of such metapopulations into new areas, while older colonies succumb to succession and other factors. Additional surveys are needed to better understand the long-term status of *C. nycteis* in Maine.

Acknowledgements

I thank Jeff Cherry, Phillip deMaynadier, and Mike Murphy for helpful information.

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Toucan in southern Veracruz; photo by Bill Berthet.
See related article next page.



Collection of butterflies from Veracruz, presented to Bill Berthet by Jim Brock. Photo by Bill Berthet, see article next page.

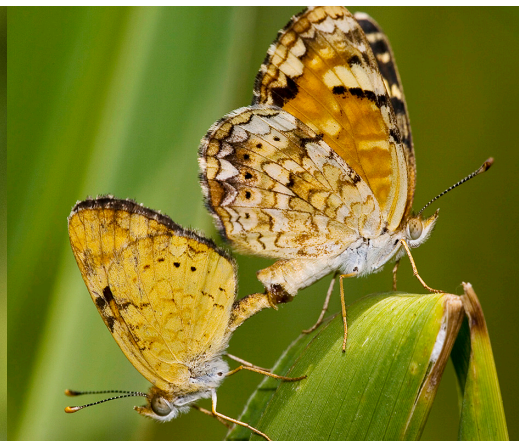
Digital Collecting:**Mexico: State of Veracruz**

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Left to right: *Strymon rufofusca*, *Danaus eresimus*, mating pair of *Phyciodes pallescens*.



This article is based on a butterfly photography and collecting holiday from August 2-11 2007, partially organized by Bob Straub, author of the book "Find birds in Veracruz" with the proceeds going to Pronatura, a conservation non-

profit company. Nelson Dobbs, Kim Garwood, myself, and our trip leader Jim Brock were participants. Thanks to Kim for allowing me to use parts of her Veracruz trip report in the narrative.



Map of the state of Veracruz, Mexico

This adventure was mostly in the highlands of central Veracruz, up in the cloud forest between 1,000-1,300 meters. We did not go to the lowlands around Catemaco.

Places visited chronologically were: Xalapa, Las Minas, Perote, Los Humeros, Cofre de Perote, Atoron coffee plantation, Xico waterfalls, along Hwy 140 at Coatepec, Muller's old hacienda, El Mirador near Totutla, and Ruiz Cortines near San Andres Tuxtla.

Nelson and I flew in from Houston arriving at Veracruz City. We rented a van from Hertz and drove to the Hotel Suites Mediterraneo located across the beach at Boca del Rio. Jim and Kim took a 16-hour ride on a UNO bus from Reynosa to Veracruz.

While waiting for Kim and Jim to arrive Nelson and I wandered around the hotel area at sea level, and were able to photograph a Red-crescent Scrub-Hairstreak *Strymon rufofusca*, Soldier *Danaus eresimus* and a mating pair of Mexican Crescents *Phyciodes pallescens*.

Veracruz state is a crescent-shaped strip of land between the Sierra Madre Oriental to the west and the Gulf of Mexico to the east, bordering the states of Tamaulipas to the north, Oaxaca and

Chiapas to the south, Tabasco to the southeast, Puebla, Hidalgo, and San Luis Potosí to the west. The topography changes drastically, rising from the narrow sea level coastal plains to the highlands of the eastern Sierra Madre and the Trans-Mexican Volcanic Belt, featuring peaks of 4,282m at Cofre de Perote to the highest peak in Mexico, Pico de Orizaba at 5,636m. Various types of forest cover the state with the dominant evergreen tropical forest having two separate endemic bird areas. The northern part of the state as well as the highest mountain areas are convergence zones between lowland evergreen tropical forests, and more temperate flora and fauna, supporting more than 1000 species of butterflies.

On August 3 we drove Northwest to Xalapa, the capital city of Veracruz. (jalapeños comes from the name Jalapa or Xalapa, where these peppers originally came from). We spent the next four nights at the Posada del Cafeto in Xalapa.

The next morning Jim drove the van on a narrow road along the edge of a large canyon heading towards Las Minas. On one of the trails off the road we observe a bunch of fresh, colorfully marked Mexican Pine-Satyr *Paramacera*

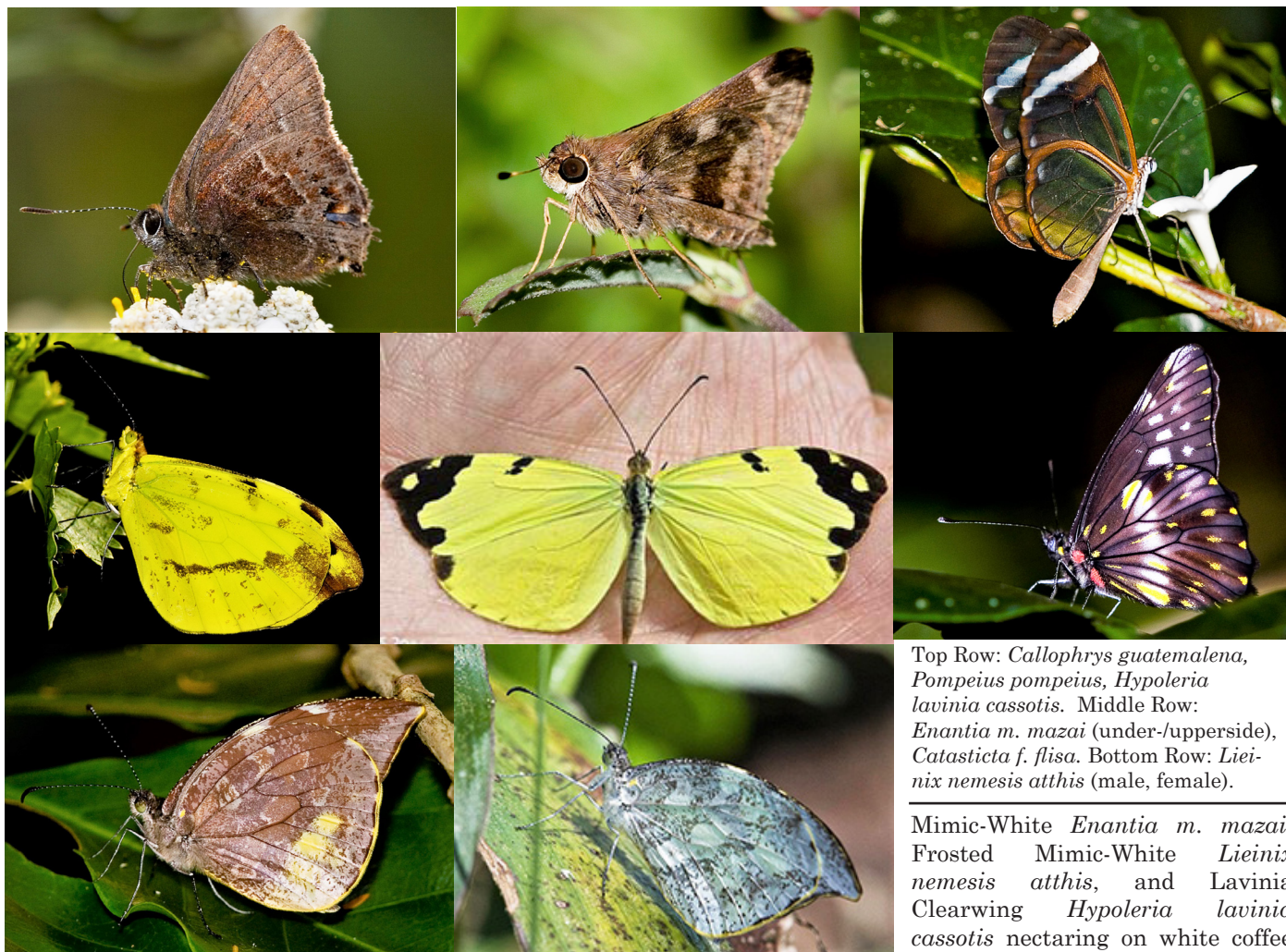
xicaque that are quite skittish, but I found one that wanted to be famous, posing nicely for a good click. Red-bordered satyrs *Gyrocheilus patrobas* were rapidly flying by, coming up along the canyon and crossing overhead. Jim caught one for us to photograph. Along the road we captured a few shots of a Pure-banded Dartwhite *Catasticta teutila flavifasciata* nectaring on a yellow composite. These yellow composites also attracted a nice collection of skippers -- Oyamel Skipper *Poanes monticola*, a pair of Morelos Skippers *Paratrytone decepta*, Snowball Skipper *Paratrytone aphractioia*, and Roever's Skipperling *Piruna roeveri*. We were hoping to observe Cloud-forest Pine satyr *Paramacera chinanteca* but did not find any.

Jim continued driving west through Perote and out into the desert to Los Humeros, with a totally different habitat. There were large Joshua tree like yuccas, very pretty but very few bugs. We only got images of a Black Checkerspot *Chlosyne cyneas*.

Later in the day as we drove up the road to Cofre de Perote Jim slammed on the brakes in the middle of the road, bolted out of the car, climbed over a barbed wire fence,



Top Row: *Paramacera xicaque*, *Gyrocheilus patrobas*, *Catasticta teutila*. Middle Row: *Poanes monticola*, *Paratrytone decepta* (pair), *Paratrytone aphractioia*. Bottom Row: *Piruna roveri* (upperside and underside), *Chlosyne cyneas*.



Top Row: *Callophrys guatemalena*, *Pompeius pompeius*, *Hypoleria lavinia cassotis*. Middle Row: *Enantia m. mazai* (under-/upperside), *Catasticta f. flisa*. Bottom Row: *Lieinix nemesia atthis* (male, female).

Mimic-White *Enantia m. mazai*, Frosted Mimic-White *Lieinix nemesia atthis*, and Lavinia Clearwing *Hypoleria lavinia cassotis* nectaring on white coffee blossoms. Additional butterflies for

and located the seldom seen Guatemalan Hairstreak *Callophrys guatemalena*. He was eager to catch it but I was not far behind so he let me take a click or two before netting the bug. On the way back down the road we had to stop for awhile because the smell of over heated brakes was overwhelming. We did get a click of Pompeius Skipper *Pompeius pompeius* while waiting.

Jim drove us back to our hotel in Xalapa (Flower Garden of Mexico) that is ringed by volcanos and cloud forests. There is a large coffee processing center there. Kim loves the coffee; they make something called lechero, which is mostly hot milk with a little coffee, in a tall glass with cinnamon and foam on the top. It is very fancy, and delicious. Xalapa is also home to the Xalapa Museum of Archaeology. The museum has a collection of Meso-American ancient art, including colossal Olmec heads, some over 11 feet tall, made out of basalt and dating back at least 5,000 years.

The next morning Bob Straub joined us for the short drive to Atoron, a coffee plantation close to Xalapa. We hiked up a truck track through the coffee plantation on a bright sunny morning. The habitat looked real good but there were not many butterflies. We did get clicks of De la Maza's

the day included Fawn-spotted Skipper *Cymaenes trebius*, Pale Sickling *Achlyodes pallida* and Narrow-banded Dartwhite *Catasticta f. flisa* male.

While Bob, Kim, and I were talking I noticed a large Mexican Black Kingsnake's head buried inside a rock pile. After



Olmec heads at the Xalapa Museum of Archaeology.



Top Row: *Cymaenes trebius*, *Achlyodes pallida* (upper-/underside). Middle Row: *Anteros carausius* (top - upperside, bottom - underside), *Parides photinus*, pupae of *Mechanitis menapis*. Bottom Row: *Eresia p. phillyra*, *Mechanitis menapis* (upper-/underside).

several minutes his head popped out with a large toad in its mouth. Seeing us it bolted out of the rock pile, disappearing in the tall grass down slope. I wish I had had the camera ready -- it would have been an amazing shot.

Late that afternoon we stopped at Xico waterfalls. It was Sunday, and so the area was packed with visitors. It clearly is better to visit during the week. One other spot that we did not visit around Xalapa was Macuiltépetl Ecological Park, a large wooded area on the slopes of an extinct volcano featuring a 5 plus kilometer trail that winds around to the top. It can be very good for birding, motmots, trogons, blue mockingbird, and has good cloud forest for butterflies.

On our last day in Xalapa we went looking for some spots Jim had visited a few years ago, out from Coatepec

towards Hwy 140. Jim found the spot, about 10km west of 140. One field of weeds had been turned into a baseball diamond, but just next to it was a dirt road that ran into a coffee plantation that bordered an old cemetery. The morning was cool and drizzly, and we dodged rain all morning and early afternoon. The bug of the day was a very cooperative Carousing Anteros *Anteros carausius* (male). We got ventral shots, but also some open wing shots, something you rarely see. Nelson went crazy taking perhaps over 100 images of this beautiful butterfly. Fluttering around was a Longwing Crescent *Eresia p. phillyra*. We also got dorsal and ventral shots of Menapis Tigerwing *Mechanitis menapis doryssus* (male). We also found a Pink-spotted Cattleheart *Parides photinus* perched under the canopy of a tree while it was raining. When it stopped raining, we got open and closed wing clicks of Banded Longwing



Top Row: *Dryadula phaetusa* (upper-/underside), *Euselasia eubule*. Second Row: *Dione moneta poeyi* (upper-/underside), *Phoebe argante*. Third Row: *Magneptychia libye*, *Taygetis rufomarginata*, *Cyllopsis h. hedemanni*. Bottom Row: *Helioptes alana*, *Staphylus mazans*.

Dryadula phaetusa (male) and Mexican Silverspot *Dione moneta poeyi* (male). Walking along a path through the cemetery we scared up a Blue-gray Satyr *Magneptychia libye*, a very fresh Rufus-margined Satyr *Taygetis rufomarginata* and the Stub-tailed Gemmed-Satyr *Cyllopsis h. hedemanni* male. A couple of skippers, Alana White-Skipper *Helioptes alana* (male) and Mazans sootying *Staphylus mazans*, joined in on the action. We finished this day with images of a Pale Apricot Sulphur *Phoebe argante* (male) and our first *Euselasia* of the trip, Dusky *Euselasia*, *Euselasia eubule* (typical segregate).

Quite satisfied we drove back to our hotel in Xalapa, sharing beverages and stories over a tasty dinner.

The next morning we drove a couple of hours from Xalapa to outside of the town of Totutla off highway 125. We arrived at Muller's old hacienda, El Mirador, where we spent 2 nights. Jorge Muller was a very gracious host, and his daughter Eileen, a biologist, made us feel very welcome. They both spoke English well and it felt like we were staying with family. The food was excellent, and there were lots of butterflies in the area. This is another coffee finca or

plantation, at about 1000 to 1100 meters, covering over 300 acres of coffee with some good forest as well. As such, we got to experience a variety of habitats.

Our favorite for the first day was found by Jim - a Zebra-tipped Metalmark *Mesene m. margaretta*. This place was cracker heaven, with 6 species of *Hamadryas* including Orange Cracker *Hamadryas fornax fornacalia* and Brownish Cracker *Hamadryas iphthime joannae*, where five were found imbibing tree sap, along with other critters.

In the afternoon we took a jeep, and pushed through four foot high vegetation blocking the trail/road to get clicks of a fresh *Drusilla* Groundstreak *Calycopis drusilla* (female), Androgeus Swallowtail *Papilio androgeus epidaureus* (female), Variable Swallowtail *Mimoides p. phaon* (see back page), and White-crescent Swallowtail *Mimoides t. thymbraeus* (male). This was a great place, with over 170 species that first day. We

headed back for a home cooked dinner and beverages, sharing stories with Jorge's son about NFL football.

Nighttime was interesting. We had three bedrooms, but shared one bathroom. However, you had to walk through two other bedrooms to get to the bathroom. Thankfully, we were all friends so no worries. The middle bedroom had French doors that opened out to a lovely veranda where we had several meals and watched Owlets (*Opsiphanes*) laying eggs on the palms at dusk, along with White-spotted Satyrs *Manataria hercyna* (see back page) fighting over territory on the trunk of a large tree right next to the veranda.

Top Row: *Mesene m. margaretta*, *Calycopis drusilla*, *Hamadryas iphthime joannae* (five) with beetle. Second Row: *Hamadryas fornax fornacalia*, *Hamadryas iphthime joannae* (upper-/underside). Bottom Row: *Papilio androgeus epidaureus*, *Mimoides t. thymbraeus*.





Top Row: *Episcada s. salvinia*, *Pyrrhogyra otolais*, *Pyrrhogyra e. edocla*. Second Row: *Eueides lineata*, *Marpesia harmonia* (under-/upperside). Bottom Row: *Opsiphanes cassina fabricii*, *Diaethria pandama*, *Ocaria petelina*.

The next day was nice and sunny. In the morning we went back to the field and found Salvin's clearwing *Episcada s. salvinia* (male), and Double-banded Banner *Pyrrhogyra otolais*. That day we also had lunch in the field. The Muller's transported a large plastic round white table with matching chairs in the back of a pickup truck and prepared a gourmet field lunch while we were still photographing butterflies. Now that's hospitality!!! After lunch we waddled around finishing the afternoon with Thick-edged Longwing *Eueides lineata*, and open and closed wing shots of Pale Daggerwing *Marpesia harmonia*.

With Jim driving the van we headed southeast for one night at a bright yellow colored hotel in San Andres Tuxtla. We saw Split-banded Owlets *Opsiphanes cassina fabricii* butterflies zipping around the palm trees at dusk.

In the morning we travelled south on Mex 180, turning left across the street from the Goodyear Tire Store. The paved road took us through some agricultural habitats, changing to good scrubby habitat, then higher up the trees got taller before reaching the small village of Ruiz Cortines at around 1100 meters. Along the way we stopped to photograph Orange-striped Eighty-eight *Diaethria pandama* (male) and a Green-spotted Banner *Pyrrhogyra e. edocla* (male) imbibing minerals in the road.

Later we pulled over at the transition zone from scrubby habitat meadow to a forest of large tall trees. Jim found a female Petelina Hairstreak *Ocaria petelina* at the edge of the forest and yelled to me to get a quick photo before he netted it. Meanwhile we observed the spectacular show of five to seven Blue and White Morphos floating through



Top Row: *Morpho polyphemus luna* (upper-/undersides). Bottom Row: *Urania fulgens* (upper-/undersides).

the air chaining after each other near the tall treetops. Mother Nature's entertainment at its best! The flight was too high for photographs. Jim surprised us later with a White Morpho, *Morpho polyphemus luna* male he netted that we got clicks of. There are two subspecies of White morphos found in Mexico. *Morpho polyphemus luna* is found in Southeastern Mexico, the other subspecies *Morpho polyphemus polyphemus* is found in Southwestern Mexico (see cover of previous issue of the News [64:4] for image of *M. p. polyphemus*).

We stayed at a small rustic cabin with two bunk beds, no windows, and no working shower. The locals were friendly and trying to please. They provided us with a pail of cold water, and took out several fish from a 55 gallon water filled drum to cook for dinner. Luckily heavy blankets were provided as it turned quite chilly that night.

In the late afternoon there was a migration of dozens and dozens of the all-year, day-flying *Urania Swallowtail* Moth, *Urania fulgens*, rapidly flying by our shelter. Their caterpillars feed on *Omphalea diandra* (Euphorbiaceae). This food plant is found in wet or moderately wet woodlands on limestone, mostly in lowland habitats but also occasionally found at higher elevations on shale. Adults feed on flower nectar and migrate in huge numbers through Central

and South America (and have been recorded in Florida and Texas). *Urania* species (Smith, Neal G. 1983) need to migrate because their food plants are slow growing vines. When the caterpillars feed the vines start to release more toxins lowering the survival rate of the caterpillars as a way of fighting back. Over the course of several years toxins in the food plants in these areas will become unsuitable for larval consumption, explaining why this moth can be over-abundant in some areas for months or years and then suddenly seem to vanish. They are forced to live a continuously nomadic lifestyle, disappearing from and revisiting habitats made suitable or unsuitable due to larval infestation. It is thought that host plant toxicity and migration cycles are interconnected.

After a simple breakfast we headed to the "Hairstreak Highway," a small tract lined with *Cordia* flowers on either side of the road.

Overall around 25 species of hairstreaks and over 200 species of butterflies were observed this day, including my favorite the White-striped Groundstreak *Calycopis clarina*. We also had clicks of



Calycopis clarina



Top Row: *Panthiades bathildis*, *Strymon ziba*, *Strymon mulucha*. Middle Row: *Cyanophrys longula*, *C. herodotus*, *C. miserabilis*. Bottom Row: *Theritas lisus*, *Eumaeus toxea*, *Pseudolycaena damo*.

Zebra-striped Hairstreak *Panthiades bathildis*, a pair of Ziba Scrub-Hairstreak *Strymon ziba* males nectaring on Firebush (*Hamelia* sp.), Mottled Scrub-Hairstreak *Strymon mulucha*, and the seldom seen Lisus Hairstreak *Theritas lisus*. Making a loud ruckus overhead was a large Toucan (see page 28). Additional green hairstreaks included Mountain Greenstreak *Cyanophrys longula*, Tropical Greenstreak *Cyanophrys herodotus* (male), and a Clench's Greenstreak *Cyanophrys miserabilis* (female). Completing our day was a Mexican Cycadian *Eumaeus toxea* and the very large attractively marked Sky-blue Hairstreak *Pseudolycaena damo* (male) with metallic sky blue upper-sides.

It was with a sincere feeling of regret that the next day we headed back to Veracruz before noon. Kim and Jim took their bus back to Reynosa. Nelson caught his flight back to Atlanta. Bill got back to Jacksonville just in time for the

birth of his first grandson.

A special heartfelt thanks to Jim Brock for putting together a collection of Veracruz butterflies (see page 28) taken on our trip for the author and for his hospitality, wit, and humor while visiting his home several times. I've really enjoyed chats with his wife Joan, and Jim showing and allowing me to photograph his very high quality butterfly collection. Additionally I have enjoyed the swapping of stories full of gold nuggets while sitting next to their pool with beverages, and talking about butterflies and many treasured field memories.

Additional pictures helping to make this a better article were provided by: Kim Davis, Mike Stangeland, Nelson Dobbs, Kim Garwood, Jim Brock, and Bill Bouton.

(References continued on page 15)

Announcements:

71st Annual Lepidopterists' Society Meeting



Annual Meeting of the Lepidopterists' Society

Billings, Montana
July 19th-23rd 2023

Please join us for the 71st Annual Meeting of the Lepidopterists' Society as we gather in Billings, Montana and enjoy the wide-open spaces of the American West. The meeting will be held from Wednesday, July 19th to Sunday, July 23rd and will be hosted by the Lepidopterists' Society, the Northern

Rockies Research and Education Services (NRRES, Lolo, MT), and the C.P. Gillette Museum of Arthropod Diversity (Colorado State University, Ft. Collins, CO). The area provides an outstanding array of scenery, western history, and opportunities for exploring a diverse flora and fauna while set in a modern city, rich in industry and innovation. Billings, the largest city in Montana, is nestled between ancient marine cliffs (the Rimrocks) to the north and the Yellowstone River (North America's longest, free-flowing river), to the south. Residents consider Billings "Montana's Trailhead," as recreational opportunities abound in nearby ranges, including the Beartooth Mountains, which boast a 10,000 foot high alpine plateau, and the older, unglaciated Pryor Mountains to the south.

Field trips will include both collecting and observing, which will feature both daytime and night collecting trips to the Beartooth and Hell-Roaring Plateaus, riparian sites along the Yellowstone River, and to the southern flanks of the Pryor Mountains with its impressive ecological richness and unique high-desert habitats. The region also hosts areas of badlands to the north of Billings and myriad public lands accessed via National Forest, State, and Bureau of Land Management properties.

The meetings and lodging will be held in the historic Northern Hotel located in downtown Billings and less than two miles from the Billings International Airport. Shuttle services are available from the airport. There are many other lodging opportunities across the city as well as camping areas in nearby towns.

The Executive Council meeting will be held Wednesday morning (July 19). The welcome reception will be at the Northern Hotel on Wednesday evening. The scientific program (talks and posters) will be scheduled for Thursday (July 20) and Friday (July 21), with Saturday morning available if needed. The annual BBQ will be held at a location just outside of town with an organized moth collecting/observing opportunity to follow the catered meal.

The banquet will be held Saturday night at the Northern, again followed by an organized nighttime collecting trip after the meal. Dark skies come late (>10pm) this far north and collecting sites are always nearby and accessible.

The organizing committee consists of Mat Seidensticker & Marian Lyman with NRRES, and Chuck Harp and Todd Gilligan with Colorado State University. Email meeting@lepsoc.org with any questions regarding the meeting.

Registration is NOW LIVE at the Lepidopterists' Society website:

Go to: <https://www.lepsoc.org/2023-annual-meeting>

The Northern Hotel

The 71st Annual Meeting of the Lepidopterists' Society is being held at the historical Northern Hotel in Billings, Montana. We have obtained a special room rate for the LepSoc meeting, which can be reserved by calling the hotel at **406-867-6767** and letting them know you are attending the Lepidopterists' Society meeting. Special meeting room rates are as follows (Rooms are subject to an 8% Bed Tax and \$2 fee, there is no sales tax in Montana):

- \$174, Classic King or Queen Room, single or double occupancy
- \$194, Classic Double Queen Room, single or double occupancy

Northern Hotel, 19 North Broadway, Billings, Montana 59101, www.northernhotel.com, 406-867-6767. Many other accommodations are available in the area, including other hotels, RV parks, KOAs, and State Parks. Keep in mind this is peak tourist season so book early!

Contributed Papers

This year's program consists of two days (or more if needed) of contributed papers and posters presented by our members. Anyone can present at the meeting (amateur, professional, student, anyone)! We especially encourage presentations by students and have significant cash awards for the best student talks and posters.

If you would like to present a talk or poster at the meeting, please download the form on the LepSoc meeting page, fill in the information, and email the completed form to meeting@lepsoc.org by 2 June 2023. Submissions received after that date are not guaranteed to be included in the program.

Meeting Registration

Meeting registration rates are as follows:

- Members (LepSoc or SEL): \$140
- Students: \$100
- Non-members: \$200

Registration includes access to pre-meeting daytime Field Trips on Wednesday, welcome reception Wednesday evening, presentations Thursday - Saturday, and moth collecting/observing most nights. Registration does NOT include the BBQ or Banquet. Tickets must be purchased separately, and options exist for purchasing extra tickets for family members who are not registered for the meeting:

- BBQ (Friday, July 21): \$25
- Banquet (Saturday, July 22): \$60

There is an option on the website for noting dietary restrictions. The BBQ will be held at the Montana Audubon Center and the Banquet will be held at the Northern Hotel.

Again, please email meeting@lepsoc.org with any questions and visit the LepSoc webpage to register. We look forward to seeing you in Montana!

Mix Family Award for Contributions in Lepidoptera

In honor of Nancy, John, Lin, and Joe Mix, the Lepidopterists' Society is pleased to announce the establishment of the "Mix Family Award for Contributions in Lepidoptera." This award will be used to honor an amateur lepidopterist (someone not professionally employed as an entomologist) who has contributed the most to the field of Lepidoptera in the view of the Awards Committee. Outstanding short-term or long-term accomplishments will be considered, and may include contributions to outreach and education, collaboration with colleagues, novel research and discoveries, building an accessible research collection, or leadership within the Society. Nominations are allowed from any member of the Lepidopterists' Society and the nominee must also be a member of the Society in good standing.

This annual award is funded by a very generous monetary donation from Steve Mix that is designated specifically for this award. Award recipients will receive a check for \$1,000 and a plaque that will be presented at the banquet at the Annual Meeting of the Lepidopterists' Society. The award will be presented to a single recipient, and any person who receives the award is not eligible to be nominated again for at least 5 years. It is estimated that the initial donation will be sufficient to sustain this award for at least 20 years. In the event that the award fund is reduced to the point where the award cannot be sustained, the Executive Council will determine if the award will continue.

PayPal -- the easy way to send \$ to the Society

For those wishing to send/donate money to the Society; purchase Society publications, t-shirts, and back issues; or to pay late fees, PayPal is a convenient way to do so. Sign on to www.PayPal.com, and navigate to "Send Money", and use this recipient e-mail address: kerichers@wuesd.org; follow the instructions to complete the transaction, and be sure to enter information in the box provided to explain why the money is being sent to the Society. Thanks!

Society of Kentucky Lepidopterists

The Society of Kentucky Lepidopterists is open to anyone with an interest in the Lepidoptera of the great state of Kentucky. Annual dues are \$15.00 for the hard copy of the News; \$12.00 for electronic copies. The annual meeting is held each year in November, at the University of KY, Lexington. Also, follow the Society's facebook page (<https://www.facebook.com/societykentuckylep/>) for meetings and potential field trips.

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

The Southern Lepidopterists' Society invites you to join

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

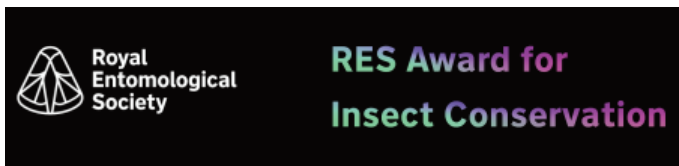
Please write Marc C. Minno, Membership Coordinator, at marc.minno@gmail.com if you have any questions. Dues may be sent to Jeffrey R. Sloten, Treasurer, 5421 NW 69th Lane, Gainesville, FL 32653.

The Association for Tropical Lepidoptera

Please consider joining the ATL, which was founded in 1989 to promote the study and conservation of Lepidoptera worldwide, with focus on tropical fauna. Anyone may join. We publish a color-illustrated scientific journal, *Tropical Lepidoptera Research*, twice yearly (along with a newsletter), and convene for an annual meeting, which may change venues and times year by year as the ATL often shares a venue with the Southern Lepidopterists' Society, as well as The Lepidopterists' Society, for their meetings. Dues are \$95 per year for regular members in the USA (\$80 for new members), and \$50 for students. Regular memberships outside the USA are \$125 yearly. See the troplep.org website for further information and a sample journal. Send dues to ATL Secretary-Treasurer, PO Box 141210, Gainesville, FL 32614-1210 USA. We hope you will join us in sharing studies on the fascinating world of tropical butterflies and moths.

Lep Soc Statement on Diversity

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



The Royal Entomological Society's Award for Conservation was established in 2002 in order to recognise a lifetime's achievement, or equivalent accomplishments, in the conservation of insects. Nominations are assessed annually by the RES Conservation Committee and recommendations submitted to Council for its final decision – no easy task due to the invariably high quality of nominees. Indeed, such has been the excellence and diversity of candidates that Council decided to award two separate Conservation Awards in two of the previous four years. And so it has been in 2022, when we are delighted to recognise the achievements of two very different entomologists, each with a reach and amazing influence for good both within and well beyond their native countries: Dr Robert M. Pyle of the USA, famous for his work on conserving Lepidoptera, especially butterflies; and Dr Úna FitzPatrick for her pioneering work on conserving bees and other pollinators in Ireland and continental Europe.

Prof. Jeremy Thomas



Dr. Robert M. Pyle,
Hon. FRES

From the 1970s onwards, Bob Pyle pioneered and popularised insect conservation in the USA at a time when fish, large mammals and certain birds and trees were more-or-less the only taxa considered worthy of conserving. He focused mainly on butterflies, and was elected as both an Hon. FRES and a Fellow of the Entomological Society of

America for his contributions to insect conservation – one of the few entomologists to receive this latter honour who are not connected to economic entomology or pest control.

In 1971-72, Pyle spent a pre-doc year as a Fulbright Scholar in the UK under the tutelage of John Heath at Monks Wood Experimental Station, where he rapidly absorbed - and contributed to - the then emerging, world-leading ideas for monitoring, understanding the ecology of, and conserving insects. This inspired Pyle to found the Xerces Society (1971), the first conservation organisation devoted to insects in either of the Americas. Xerces has been a great success and still flourishes as a major driver of policy and conservation practice in the States.

After a doctorate under Charles Remington at Yale, Pyle, Sally Hughes and Remington instituted the annual 4th of July Butterfly Counts, which remain a hugely popular vehicle for lay involvement with insects and which increasingly yield rigorous data on changing abundances across North America. Xerces and the 4JBCs were the models for similar activities soon to be established across Europe. In 1976, with Lincoln Brower, Pyle initiated conservation efforts for the threatened phenomenon of the migratory Monarch butterfly. He then spent two years establishing butterfly conservation in Papua New Guinea - where it was pretty much unknown - including the sustainable breeding of common species for village-supportive butterfly farms and the conservation of the rare giant birdwings. In Australia, Bob Pyle is revered as one of the 'big three' pioneers of global butterfly conservation.

Since then he has used his exceptional gifts as an entomologist, scientist, author, poet, teacher and communicator to advance the popularity, knowledge and conservation of insects – particularly butterflies - across the world. For example, during three years in 1979-82 at the IUCN/WWF's Conservation Monitoring Centre at Cambridge, he co-compiled (with Sue Wells and Mark Collins) the first IUCN Invertebrate Red Data Book, which laid the blueprint for all subsequent global assessments. He has also taught, lectured and inspired others repeatedly across Europe, as various nations 'discovered' and grew concerned about declining butterfly populations.

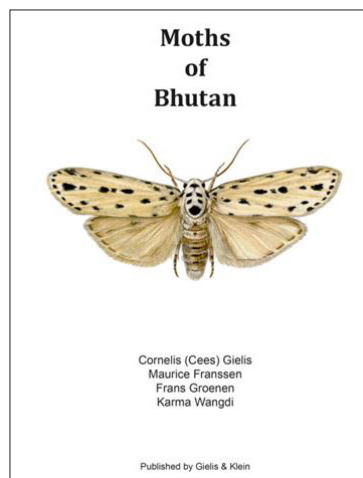
In America, Bob Pyle has popularised butterflies as author of *The Audubon Society Field Guide to North American Butterflies*; *Mariposa Road: The First Butterfly Big Year*; *The Butterflies of Cascadia: A Field Guide to All the Species of Washington, Oregon, and Surrounding Territories*; *Peterson Field Guide Coloring Books for Insects and Butterflies* [both for children]; *Handbook for Butterfly Watchers*; and *Butterflies of the Pacific Northwest*.

Bob Pyle is also a poet and general author of note, winner of various literary prizes including a Guggenheim Fellowship. Among the books where he brings art and literature to insect natural history are *The Art of the Butterfly*; *Nabokov's Butterflies*; and *Chasing Monarchs: A Migration with the Butterflies of Passage* (1999), the last an unusual combination of original research presented as a popular book, in which he tracked the southerly migration of western Monarchs over many weeks, thereby demonstrating for the first time that some Monarchs cross into Mexico west of the Rockies and proving that the eastern and western populations, hitherto considered separate and more vulnerable, are integrally connected.

(Announcements continued on page 13)

Book Review

MOTHS OF BHUTAN. by Cornelius (Cees) Gieles, Maurice Franssen, Frans Groenen, and Karma Wangdi. Paperback, 419 pages, ISBN: 978-90-9035880-2, published privately by the authors Gieles and Klein in August, 2022; £28.00 from Pemberley Nat. Hist. Books



The book starts with an introduction, which summarizes the contents of the book (plates covering 1424 of 1938 species presently known from the country). Included in the book are descriptions of 14 species new to science, half of which are tortricids. This is followed by the acknowledgements section, and then a methods and localities section, which indicates where the data were

gathered for the book. Included in this section is a map with 156 different collecting localities. 512 of the species included in the book are known only from the literature and 745 covered for the first time in the present work. The authors indicate that this is a work in progress – estimations are that there are likely somewhere between 4000 and 5000 species in the country.

The main part of the book is a long series of species accounts for each of the 1938 species (this covers 128 pages). Each entry includes the current species name (including author and year), original description (OD) name (with page number in the OD) as well as the type locality, synonyms, literature/collecting/photography locations, known host plants, flight periods, altitude range of occurrence, and wingspan of the illustrated specimen (if applicable).

The species accounts are followed by ten pages of 14 new species descriptions. Also included are first descriptions for females/female genitalia of *Arotrophora paiana*, *Clepsis gemina*, and *Lumaria phuntshona*; and the male/male genitalia of *Neopotamia atrigrapta*. The descriptions are, in turn, followed by three pages of an addendum of species that were added late in the printing process.

Then are the plates: 1 - 183 show specimens, 184 - 192 are selected genitalia (six plates of male genitalia, three plates of female genitalia -- including the genitalia of the newly described species), and then 193 - 196 are plates of more specimens representing the addended species mentioned above. All plates of all species show two columns (images are arranged top to bottom, not side to side) of four specimens (eight species on each plate), all of approximately equal size, with no scale indications whatsoever. People who are

familiar with the species should have little issue with the lack of scale markers, but the book would have been helped by including some indication of scale. The specimens also do NOT have individual numbers on the plates, so if you forget they are arranged top to bottom instead of side to side, identification could be confused by the numbered captions at the bottom of each plate. Having said that, the images in the plates are very sharp and bright, and most (though not all) of the specimens are well prepared. This book should work well for identifying a significant majority of the species pictured in the book.

The species accounts are organized phylogenetically to subfamily, and then alphabetically by genus and species within the subfamilies. I was initially impressed with the 35-page reference section at the end of the book. However, with as extensive a literature review as was apparently done, the classification should be up-to-date. This is clearly not the case, at least with some groups. I am personally more of a noctuid guy than anything else, so I will limit my remarks to the Noctuoidea section. This should, however, make the reader cautious about following the higher classification in other sections of the book as well.

The authors begin the Noctuoidea section with the family Arctiidae, and remark that this “family” is now considered part of the Erebiidae. Yet they continue to present Arctiidae as a separate family in this work, indicating they are following the Finnish website **Lepidoptera (funet.fi)**; they also follow this website in including the Syntomini as part of the Ctenuchinae. I do not know why this website has significance to the authors, and I have not seen these classifications continued anywhere else. In the Erebiidae, the two species of *Catocala* are included in the subfamily Erebiinae, though virtually all other resources have a separate subfamily for the *Catocala* and allies, namely the Catocalinae. In the Noctuidae, they include *Spodoptera* in Amphipyrrinae, *Chytonix* in Condicinae, *Orthosia* in Hadeninae, and *Apamea* and *Athetis* in Xyleninae. All of these placements are old, and all are now included in a broad Noctuinae, in various different tribes. There are likely other misplacements, but these are genera I am familiar with from the U.S. fauna. So, although I find nothing wrong with the species accounts, be cautious in using the authors' higher classification, as much of it may be out-of-date. I also found a couple of misspellings (there may be more) on page 154, where Arctiinae is misspelled Arctiniinae and Lithosiinae is misspelled Lithosinae. Neither of these should cause any confusion, however.

The MOST important item about this book that lepidopterists should be excited about is the fact that it beautifully illustrates a large number of species whose images are not likely to be available elsewhere. As such, especially for those interested in the moth fauna of the Himalayan and neighboring regions, this book is definitely worth a look.

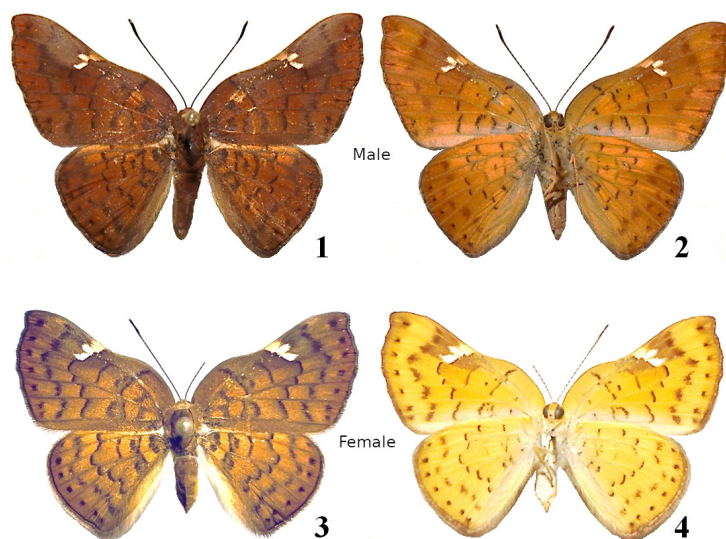
James K. Adams, Dalton State College, Dalton, GA 30720
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Life history notes on the Curve-Winged Metalmark *Emesis emesia* (Riodinidae: Riodininae) in the Lower Rio Grande Valley of Texas

Richard Boscoe¹ and Berry Nall²

¹150 Ridge Pike A101, Lafayette Hill, PA 19444

²PO Box 22, Falcon Heights, TX 78545 lb@thenalls.net



Figures 1-4: *Emesis emesia*, ex ova, ex female collected 10 November, 2006, Peñitas, Hidalgo Co. TX. 1-2 Male; 3-4 female.

A common species in Mexico (Kendall, 1976), this metalmark (Figs. 1-4, 12-13 [see back cover for 12-13]) occurs in most years in small numbers in the LRGV. Kendall (1976) reported rearing *Emesis emesia* in Mexico on *Caesalpinia mexicana* (Leguminosae: Caesalpinoideae) following the observation by W. W. McGuire of a female ovipositing on leaves. A small native tree, *C. mexicana* is often grown as an ornamental in the LRGV (Richardson and King, 2011).

The metalmarks fly throughout the year. They favor riparian habitat, and most recorded sightings are in towns or parks close to the Rio Grande River where there are long-established plantings of the host tree. Populations near Relampago (Hidalgo Co.) and in Roma (Starr Co.) were observed to persist for several years, but disappeared after the devastating freeze that struck the LRGV and northern Mexico in 2021. Reports in social media of sightings in the fall of 2022 suggest the species is starting to return to the area.

The senior author observed females ovipositing on *C. mexicana* 30 October 2013 near Relampago. Several females were collected and oviposited in confinement. The junior author subsequently collected eggs and larvae in Roma 26 November 2014 and 8 June 2020. Eggs are placed on the ventral leaf surfaces and larvae eat foliage. Early instars rest on leaves when not

feeding. Some larvae in later instars silk two leaflets into a nest from which they emerge to feed nocturnally. Others continue to rest on leaves without constructing shelters. At all stages they build silk pads upon which they rest.

DESCRIPTION OF IMMATURE STAGES

Ovum (Fig. 5). Smooth flattened hemisphere with deep sunken area surrounding the micropyle. Very pale blue outside the micropyle when first deposited; changing to white with development.

First instar (Fig. 6). Pale yellow with long pale setae extending sideways from subspiracular bases and sparse, shorter black setae along dorsum. Head capsule also pale yellow.

Second instar (Fig. 7). As first instar but slightly darker, setae shorter. Viewed from above, sides of larvae have zig-zag pattern produced by protrusion of subspiracular setal bases.

Third instar (Fig. 8). Body pale green, otherwise as previous instar.

Fourth instar (Fig. 9). Body pale green. Head capsule green at beginning of instar, darkening to yellow as stage progresses. Faint pale dorsal stripes may be visible.

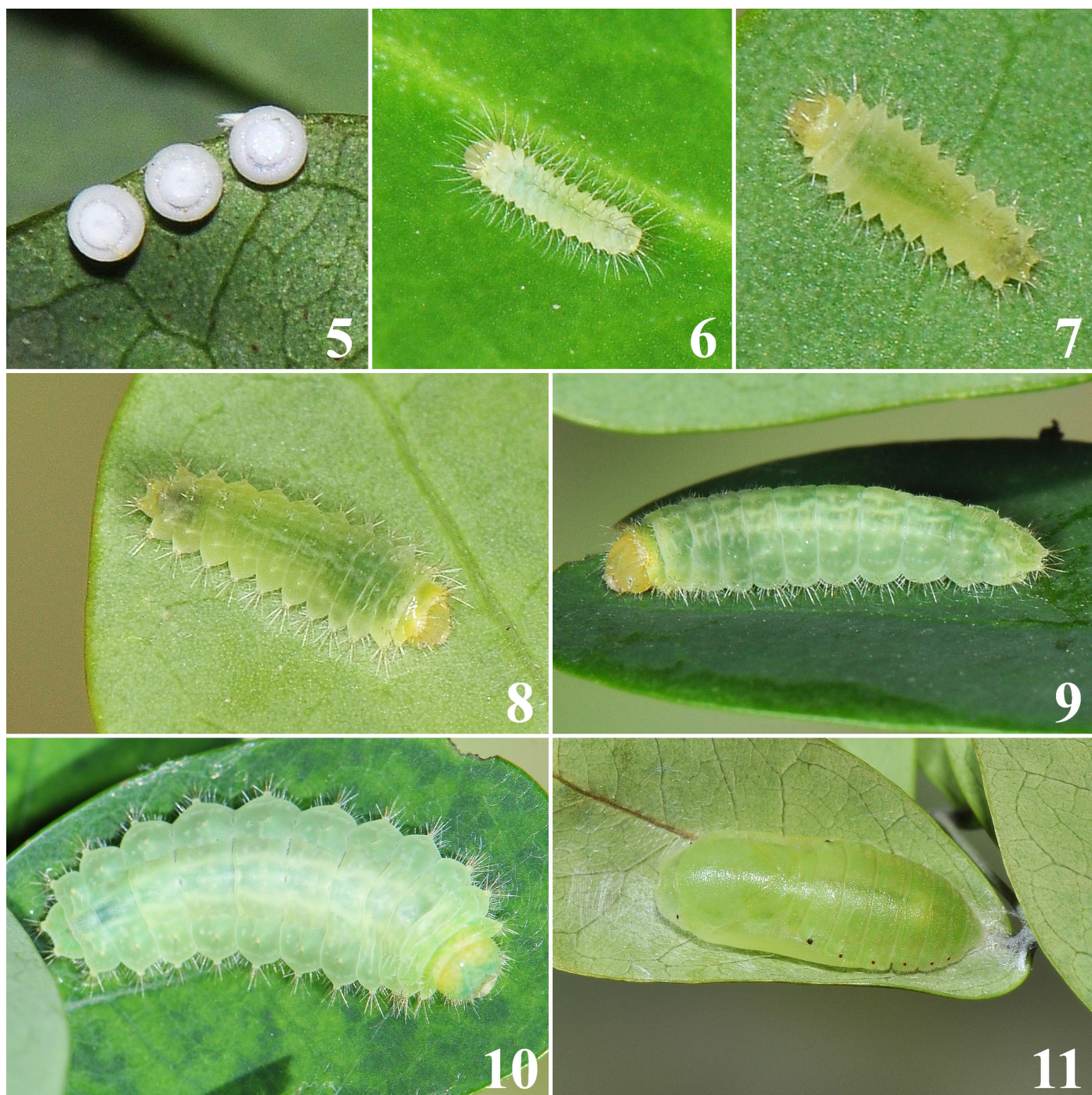
Fifth instar (Fig. 10). Body pale green, dorsum noticeably lighter. Faint striping as previous instar. Head capsule again initially green, darkening as instar progresses. Length approximately 1.5 cm.

Pupa (Fig. 11). Smooth, green, with 2 spots at anterior end and 6 spots along each side of abdomen.

ACKNOWLEDGMENTS

We thank David M. Wright for providing the photographs of the pinned specimens.

(Figures 12 and 13 are on the back cover).



Figures 5-11: Immature stages of *Emesis emesia*. 5 Ova; 6 first instar; 7 second instar; 8 third instar; 9 fourth instar; 10 fifth instar; 11 pupa.

Literature Cited

- Kendall, R. O. 1976. Larval foodplants and life history notes for some metalmarks (Lepidoptera: Riodinidae) from Mexico and Texas. *Bulletin of the Allyn Museum*, 32: 9.
- Richardson, A. and K. King. 2011. *Plants of Deep South Texas*. Texas A&M University Press, College Station. 457 pp.



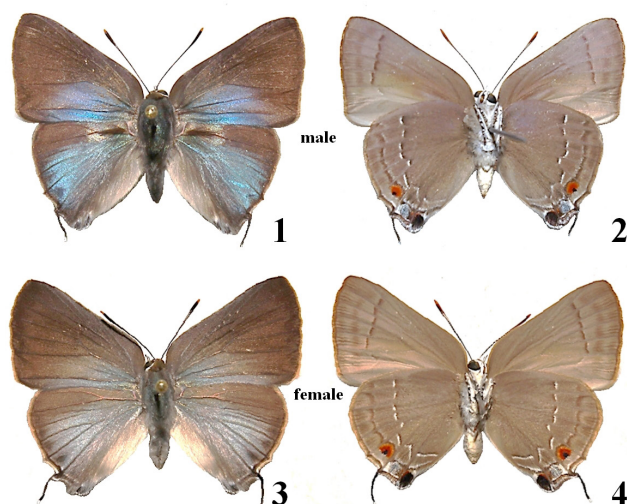
www.lepsoc.org
and <https://www.facebook.com/lepsoc>

Life history notes on the *Stophius* Hairstreak *Allosmaitia strophius* (Lycaenidae: Theclinae) in the Lower Rio Grande Valley of Texas

Richard Boscoe¹ and Berry Nall²

¹150 Ridge Pike A101, Lafayette Hill, PA 19444

²PO Box 22, Falcon Heights, TX 78545 lb@thenalls.net



Figures 1-4: *Allosmaitia strophius*, ex ova, ex female collected 14 November, 1993, Madero, Hidalgo Co. TX. 1-2 Male; 3-4 female.

Ranging from southern Texas to southern Brazil (Kaminski and Freitas, 2010), *Allosmaitia strophius* (Figs. 1-4,13) was first recorded for the U.S. and Texas by Roy Kendall 11 November 1968 at the Santa Ana Refuge in Hidalgo County (Kendall, 1970). It is unique in the U.S. fauna in that the male scent pads are located on the hind wings. *A. strophius* is rare and sporadic in the LRGV, where it breeds at least occasionally on *Malpighia glabra* (Malpighiaceae). This native shrub, widely planted in the LRGV, bears pink flowers which produce a red drupe (Richardson and King, 2011). Larvae in the genus *Allosmaitia* are apparent specialists on Malpighiaceae (R. Robbins, pers. Comm.). Adults in the LRGV are most often found on *Symphyotrichum subulatum* (Asteraceae), *Chromolaena odorata* (Asteraceae), and *Lantana* species (Verbenaceae).

Kaminski and Freitas (2010) published on the biology and early stages of *A. strophius* in Brazil, providing a summary of host plant records for *Allosmaitia*, all in the Malpighiaceae. Oviposition on flower buds and larval feeding on buds and flowers were observed. The cryptically polychromatic larvae resemble the flowers on which they are feeding. No myrmecophily was observed.

The senior author reared *A. strophius* from confined females collected 14 November 1993 south of Mission,

Hidalgo Co. Larvae consume buds, flowers, and developing fruits. Subsequently, eggs were observed on *M. glabra* flower buds at the site of collection near Mission. A female, again collected by the senior author near Penitas, Hidalgo Co., 6 November 2015, oviposited in confinement on *M. glabra*. Several larvae from these eggs were reared by the junior author. In the latter instars these were offered and readily accepted flowers and fruit of *Mascagnia macroptera* (Malpighiaceae), an ornamental planted throughout the LRGV.

DESCRIPTION OF IMMATURE STAGES

Ova (Fig. 5). The distinctive eggs are light green when deposited, turning to yellow before the caterpillar emerges. They have elevated ribs that generally form hexagonal patterns, giving the eggs a "beehive" appearance.

Neonate (Fig. 6). Yellow with long, sparse pale white setae.

First instar (Fig. 7). Develops pale addorsal lines late in instar.

Second instar (Fig. 8). On each segment, the subspiracular setae occur in pairs on a raised base, and above these, there is only a single seta on a raised base in the addorsal area. Coloration begins to show dependence on food, especially between addorsal setae and at bases of subspiracular setae.

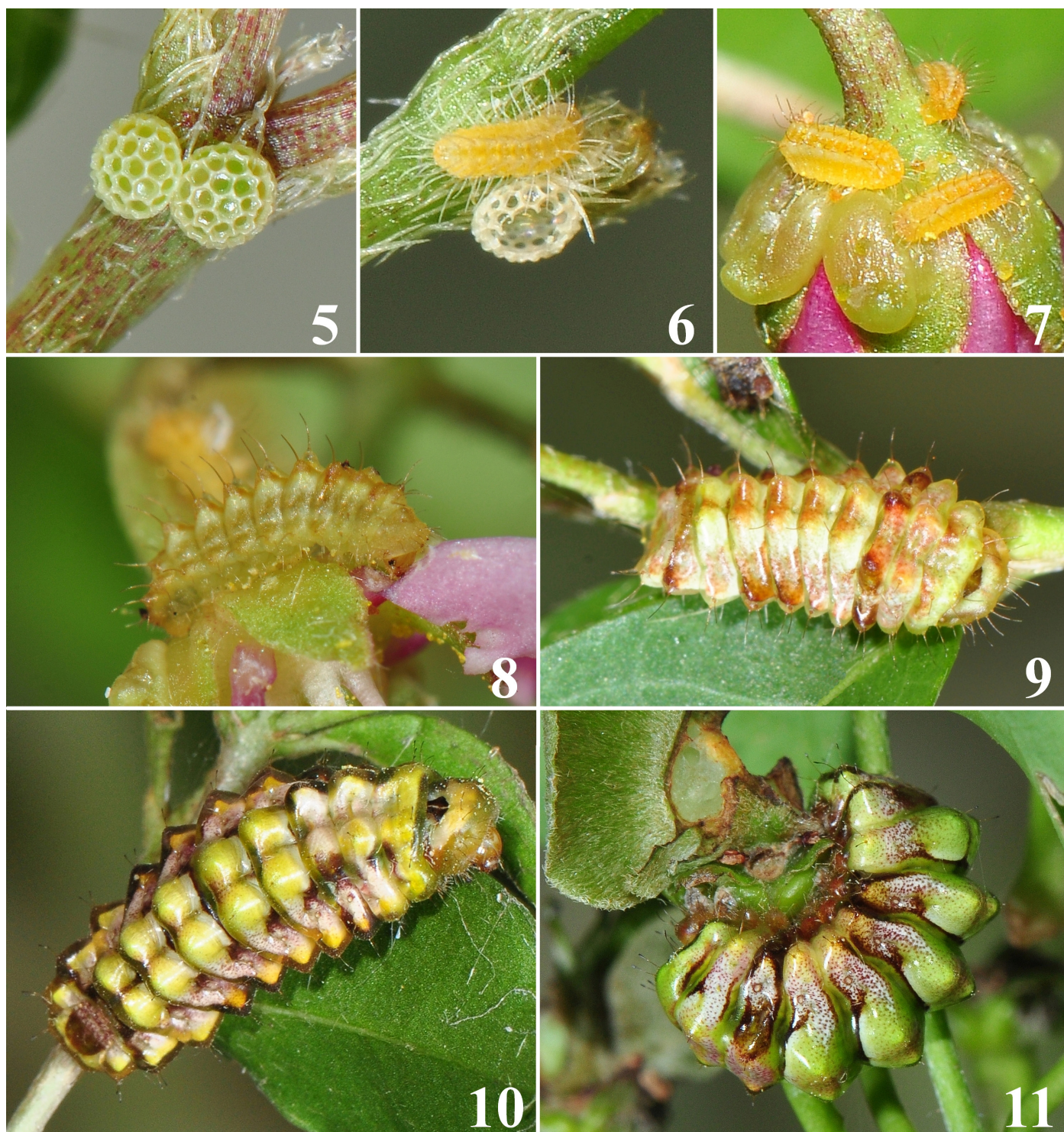
Third instar (Fig. 9). Coloration continues to strengthen.

Fourth instar (Figs. 10-11). Strong coloration gives larva a cryptic appearance when feeding (Fig. 11). The smooth skin is shiny and, without setae to break up the surface, gives the caterpillar the appearance of having metallic plates along its back.

ACKNOWLEDGMENTS

We thank David M. Wright for providing the photographs of the pinned specimens.

(Figures 12 [pupa] and 13 [adult] are on the back cover).



Figures 5-11: Immature stages of *Allosmaitia strophius*. 5 Ova; 6 neonate; 7 first instars feeding on *Malpighia glabra* bud; 8 second instar; 9 third instar; 10 fourth instar; 11 fourth instar in typical feeding position, on fruit of *Mascagnia macroptera*.

Literature Cited

- Kendall R.O. 1970. Three hairstreaks (Lycaenidae) new to Texas and the United States. *Journal of Lepidopterists' Society* 24(1): 59-61.
- Lucas A. Kaminski & André V. L. Freitas (2010) Natural history and morphology of immature stages of the butterfly *Allosmaitia strophius* (Godart) (Lepidoptera: Lycaenidae) on flower buds of Malpighiaceae. *Studies on Neotropical Fauna and Environment* 45(1): 11-19.
- Richardson, A. and K. King. 2011. *Plants of Deep South Texas*. Texas A&M University Press, College Station. 457 pp.

Membership

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

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

Dues Rate

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

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

Change of Address?

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

Chris Grinter, Secretary
The California Academy of Sciences
55 Music Concourse Drive,
San Francisco, CA 94118
cell: 847-767-9688
cgrinter@gmail.com

Missed or Defective Issue?

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

Memoirs

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

Submissions of potential new Memoirs should be sent to:

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

Journal of The Lepidopterists' Society

Send inquiries to:

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

Book Reviews

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

James K. Adams
(see address opposite)
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Submission Guidelines for the News

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

1. Electronically transmitted file and graphics — in some acceptable format — via e-mail. Graphics/figures should be at least 1200 x 1500 pixels/inch² for interior use, 1800 x 2100 for covers.
2. Article (and graphics) on disk or thumb drive in any of the popular formats/platforms. Indicate what format(s) your disk/article/graphics are in, and call or email if in doubt. The InDesign software can handle most common word processing software and numerous photo/graphics software. Media will be returned on request.
3. Color and B+W graphics; should be high quality images suitable for scanning. Original artwork/maps should be line drawings in pen and ink or good, clean photocopies. Color originals are preferred.
4. Typed copy, double-spaced suitable for scanning and optical character recognition.

Submission Deadlines

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

	Issue	Date Due
65	2 Summer	May 12, 2023
	3 Fall	August 15, 2023
	4 Winter	November 15, 2023
66	1 Spring	February 15, 2023

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

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

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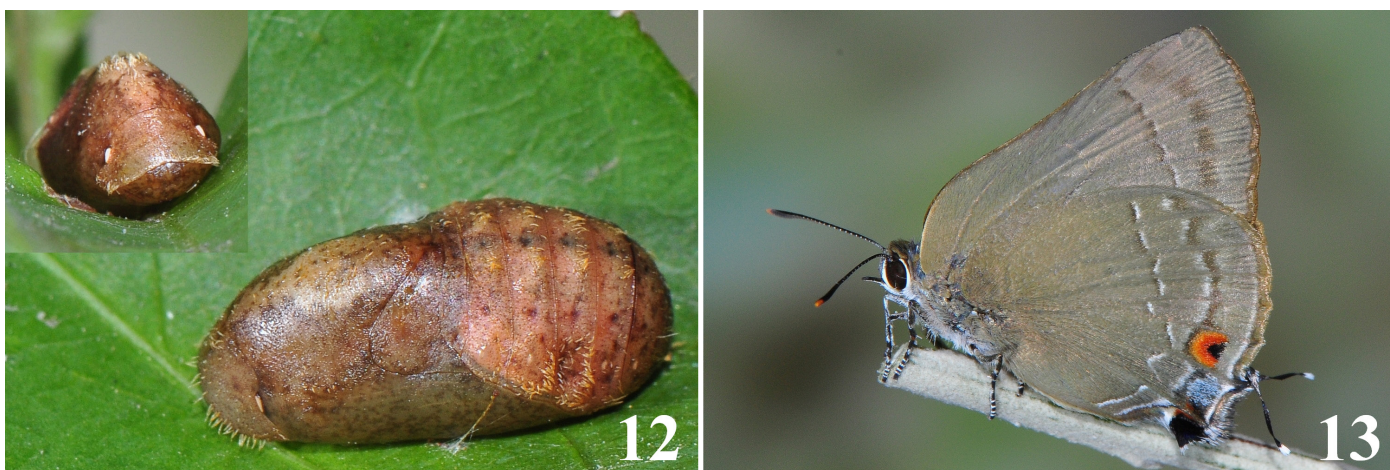
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Left to right: *Mimoides p. phaon*, *Taygetis thamyra*, and *Manataria hercyna*. Mexico, State of Veracruz, outside of the town of Totutla off highway 125, at Mueller's coffee hacienda/finca, El Mirador, 1000 to 1100 m. The first two images are by Bill Berthet from early August, 2007; *Manataria* image by Bill Bouton, May 13, 2008. See related story page 29.



Figures 12-13: Fresh male *Emesis emesia*, ex ova 17 December, 2013. 12 Dorsum; 13 ventrum. Images by Berry Nall and Richard Boscoe; see related article, page 42.



Figures 12-13: *Allosmaitia strophius* pupa and adult. 12 Pupa (inset: longitudinal view); 13 fresh adult ex ova 14 December, 2015. Images by Berry Nall and Richard Boscoe; see related article, page 44.

