

# NEWS

OF THE

# LEPIDOPTERISTS' SOCIETY



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***... and more!***



# NEWS OF THE LEPIDOPTERISTS' SOCIETY

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The Lepidopterists' Society is a non-profit educational and scientific organization. The object 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:

The first photo of *Aglais io* in North America, taken at St-Bruno-de-Montarville, Québec, 1997 (Photo: André Simard; see related article, pg. 128).

Digital Collecting:

# The moths of South Africa, part 2: Noctuoidea

David Fischer

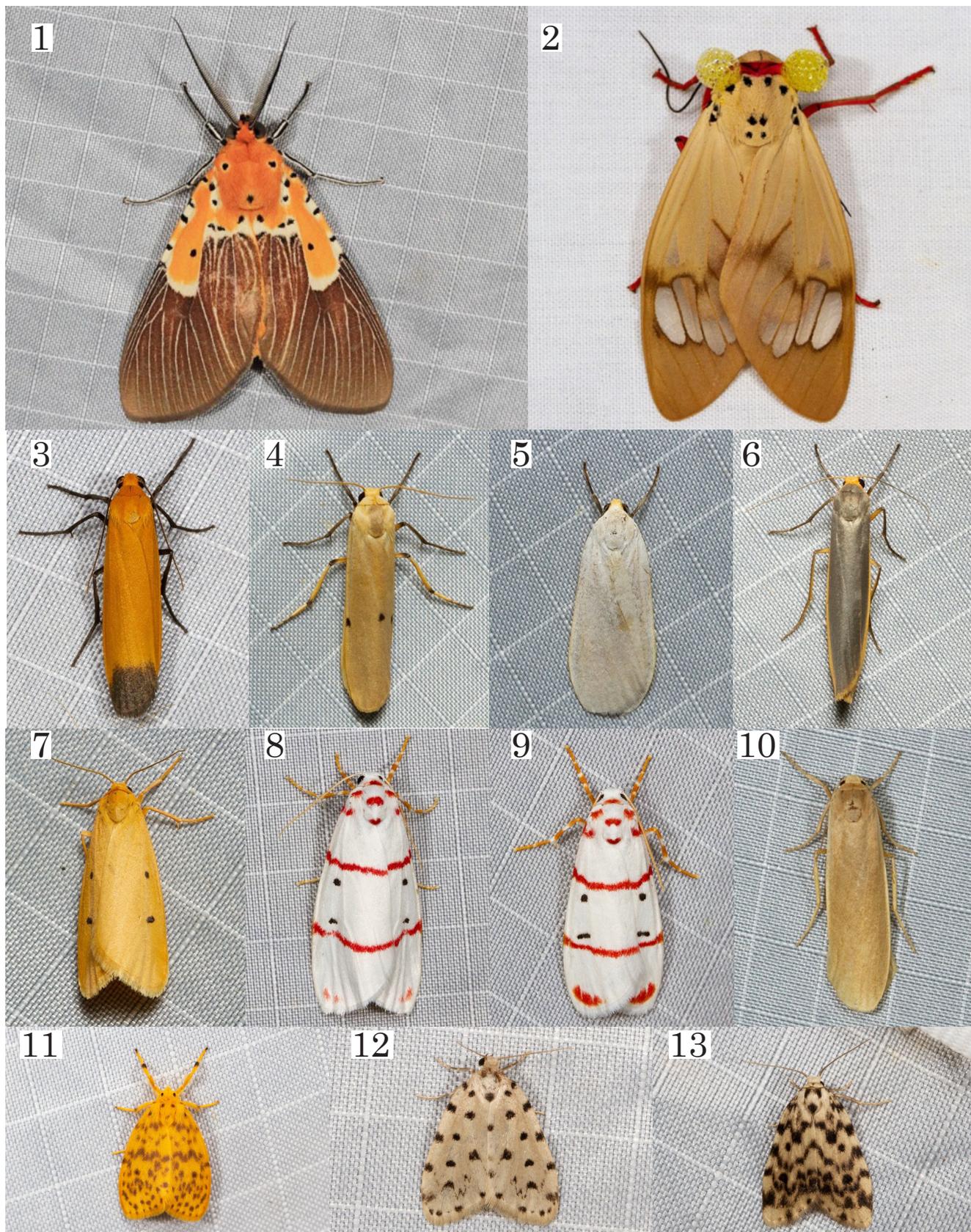
12 Byarong Ave, Mangerton, NSW 2500, AUSTRALIA [dfische5@csc.com](mailto:dfische5@csc.com)

This is the second and final part of the photo essay on the moths of South Africa. To enjoy the first part, please see the Summer issue of the News of the Lep Soc, 60(2): 55-65 (and back cover). David shows not only a lovely selection of cossids, limacodids, pyraloids, bombycoids, and geometroids, but also describes and provides images of a number of the awesome places he visited while taking his images. Here he presents images of some of the very diverse noctuoids he encountered during his trips to South Africa. Enjoy!!

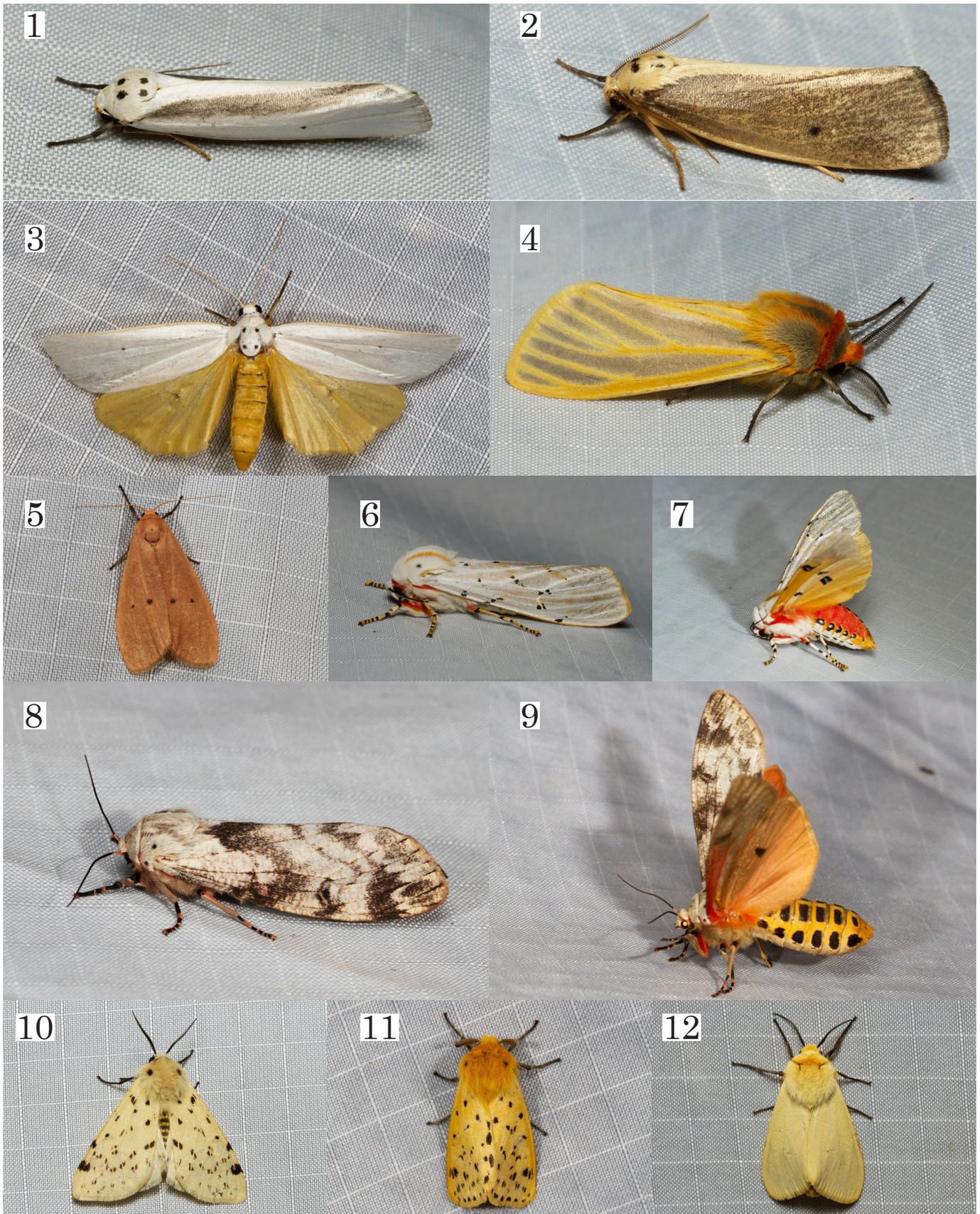
James Adams (editor)



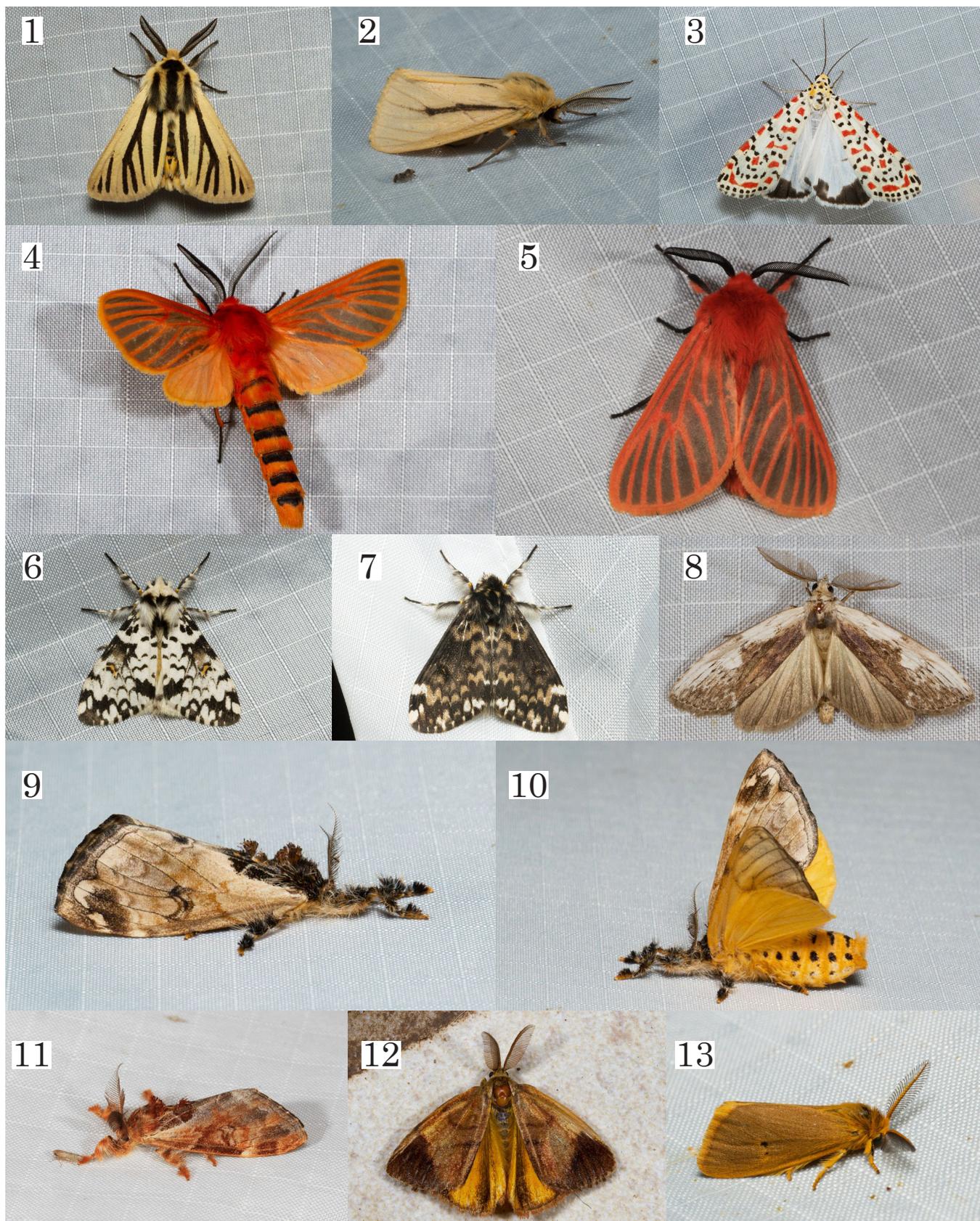
**NOTODONTIDAE:** 1) *Polienus capillata*; 2) Unknown; 3) *Fentonina punctum*; 4) *Afroplitis dasychirina*. **NOLIDAE:** 5) *Blenina* sp.; 6) *Risoba sticticraspis*; 7) *Earias* sp. Larger threads on the sheets are 5 mm apart.



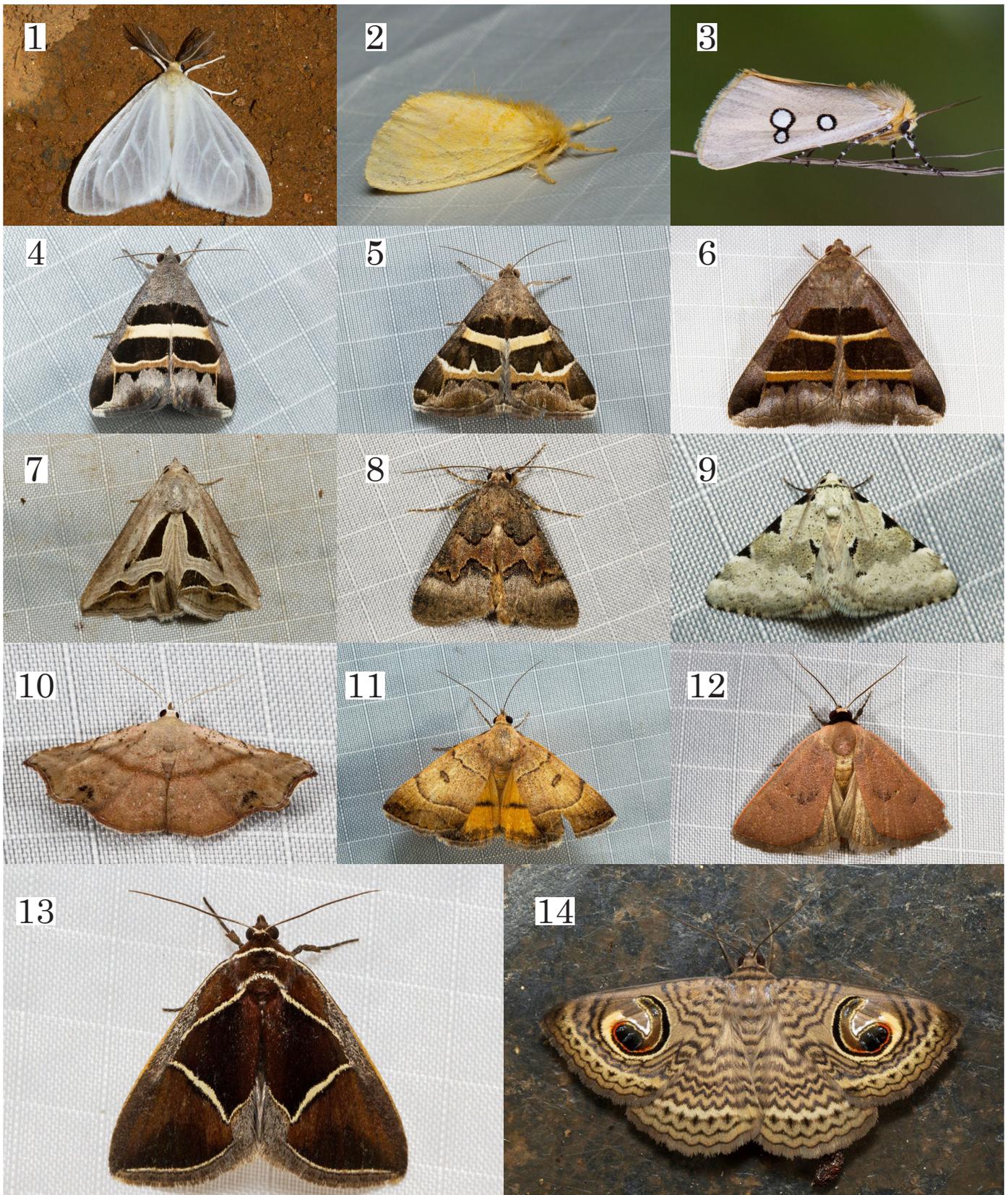
**EREBIDAE:** AGANAINAE: 1) *Asota speciosa*. ARCTIINAE: 2) *Amerila bauri*; 3) *Lepista pandula*; 4) *Cragia distigmata*; 5) unknown; 6) *Manulea* sp.; 7) *Cyana rejecta*; 8) *Cyana* sp.; 9) *Cyana* sp.; 10) *Brunia vicaria*; 11) *Afrasura rivulosa*; 12) *Siccia caffra*; 13) *Siccia punctipennis*. Larger threads on the sheets are 5 mm apart.



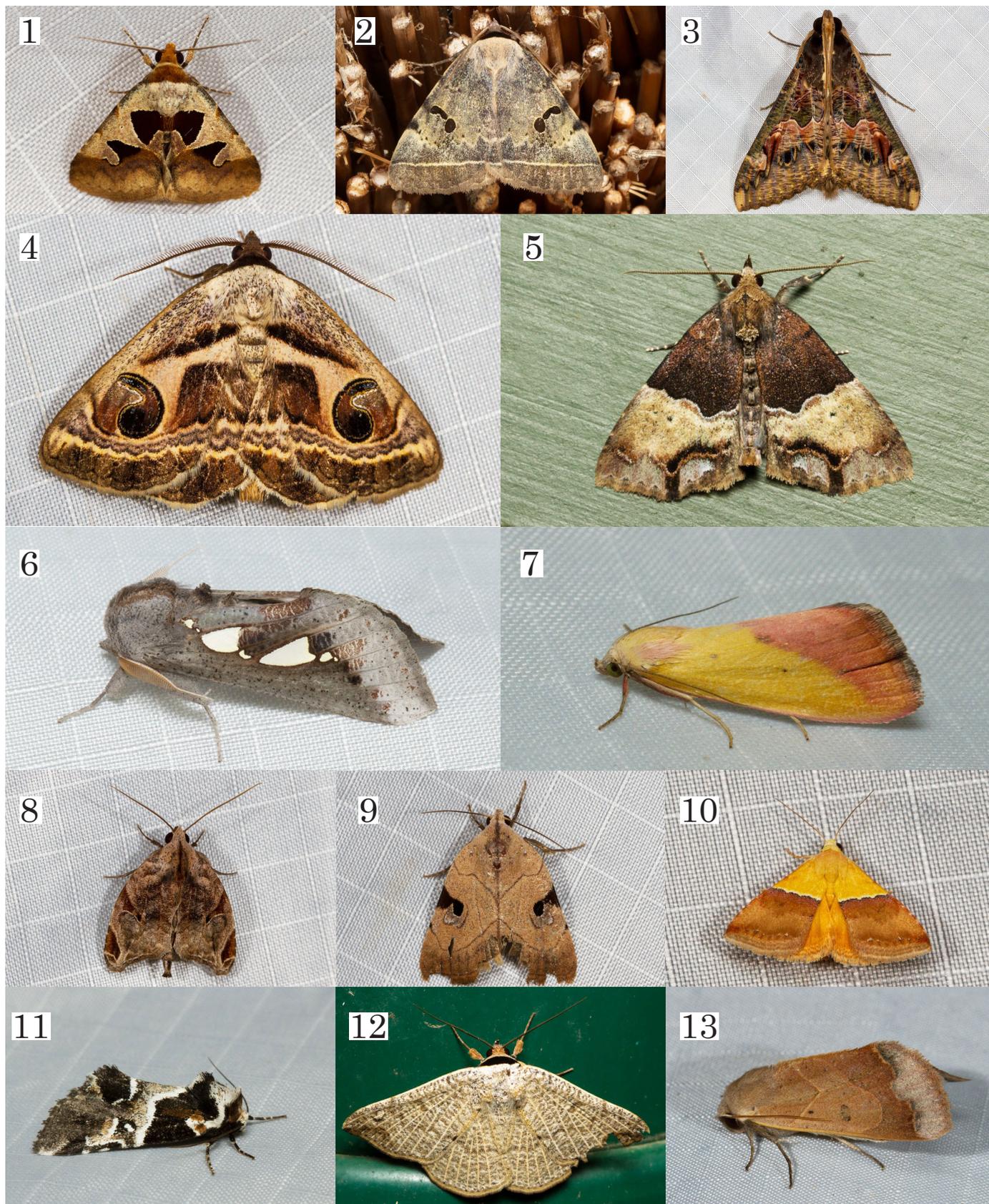
**EREBIDAE: ARCTIINAE:** 1) *Ilemodes* sp.; 2) *Ilemodes heterogyna*; 3) *Paraona interjecta*; 4) *Pseudoradiartia scita*; 5) *Lysceia bigutta*; 6 & 7) *Rhodogastris similis*; 8 & 9) *Teracotona rhodophaea*; 10) *Eyrarpenus* sp.; 11) *Eyrarpenus testacea*; 12) *Saenura flava*.



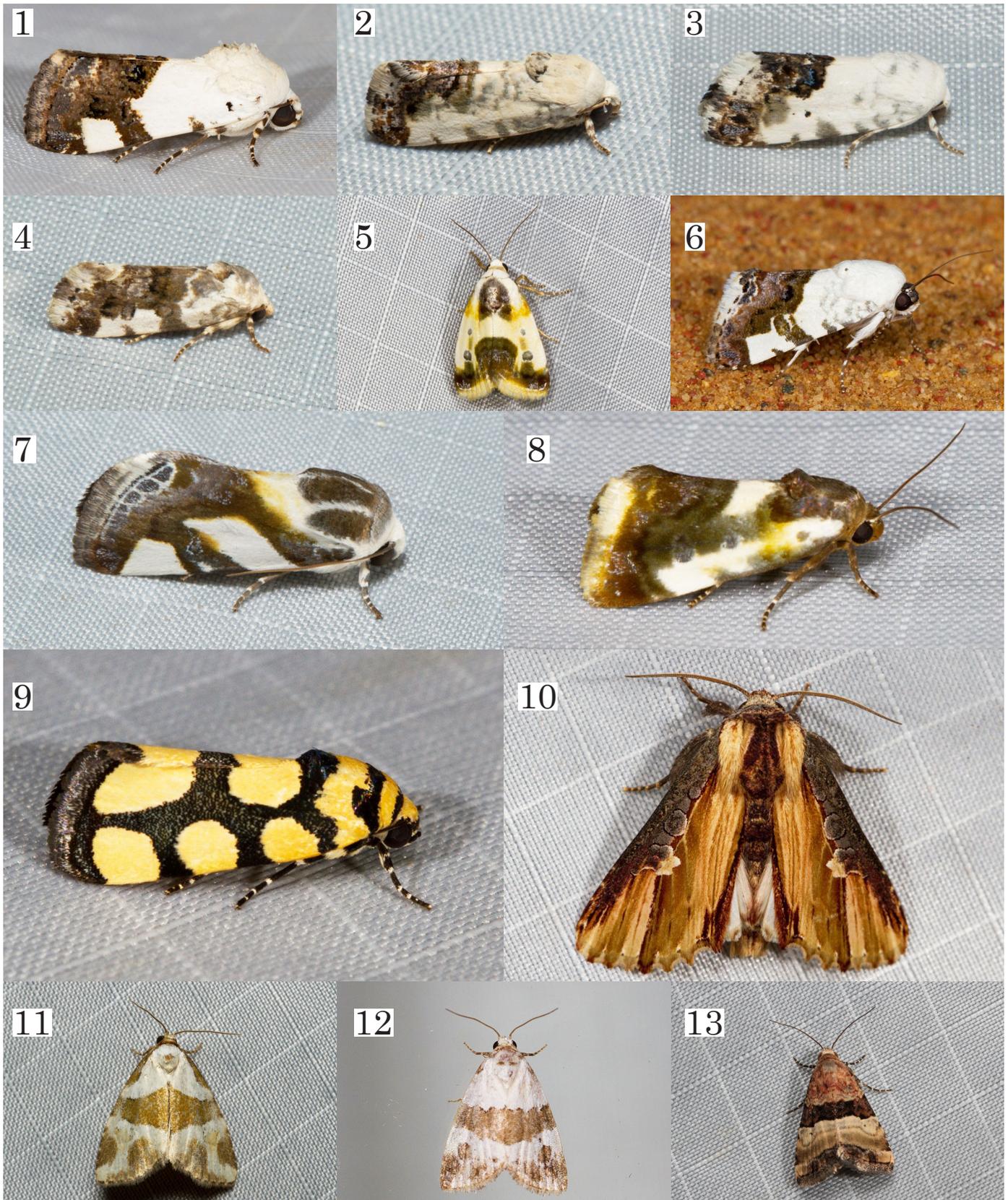
**EREBIDAE:** ARCTIINAE: 1) *Popoudina lemniscata*; 2) *Popoudina linea*; 3) *Utetheisa* sp.; 4 & 5) *Automolis (Hebena) lateritia*. LYMANTRIINAE: 6) *Rhyopteryx* sp.; 7) *Rhyopteryx* sp.; 8) unknown; 9 & 10) *Hemerophanes libyra*; 11) *Hemerophanes* sp.; 12) *Aroa discalis*; 13) *Bracharoa quadripunctata*. Larger threads on the sheets are 5 mm apart.



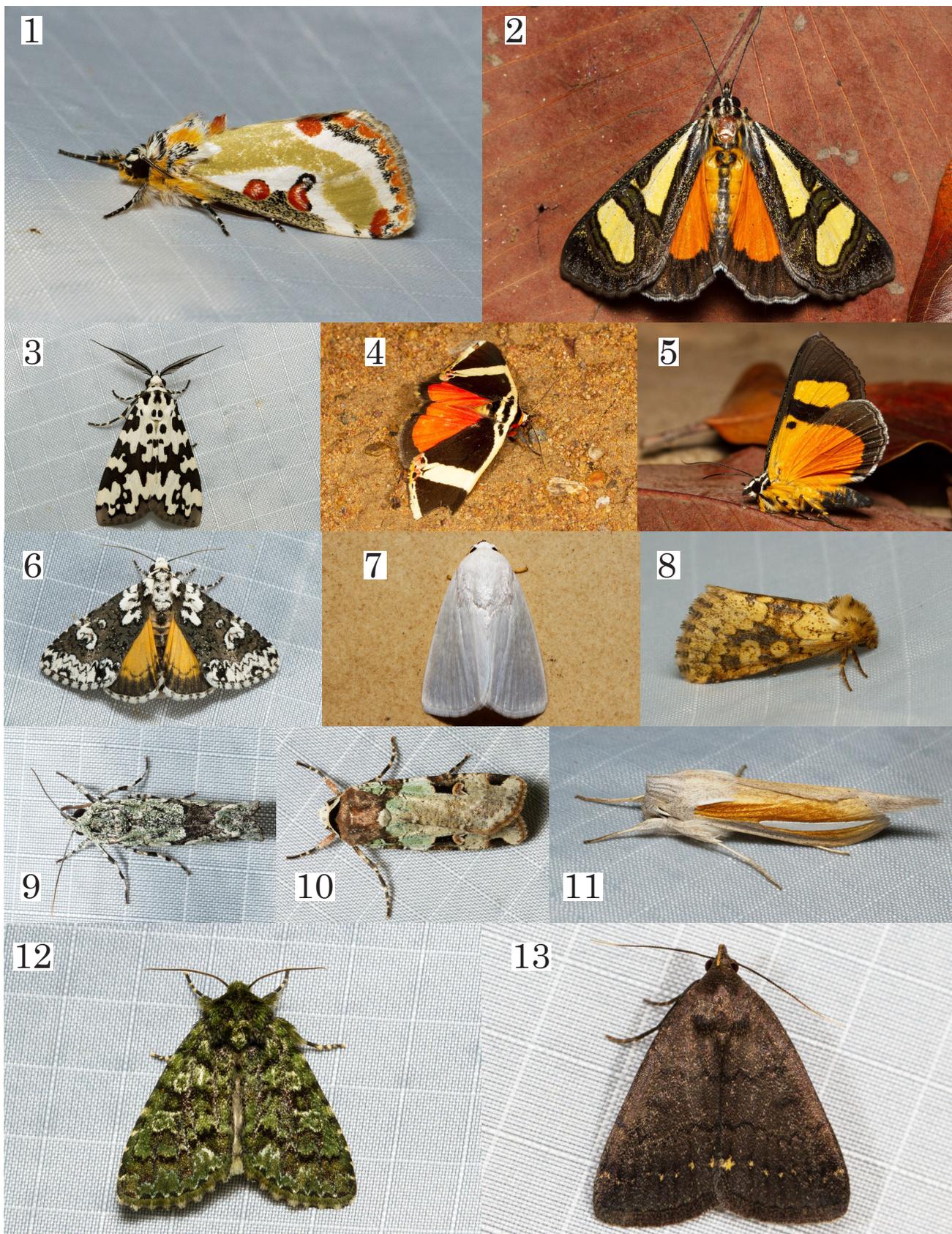
**EREBIDAE:** 1) *Olapa* sp.; 2) *Euproctis* sp.; 3) *Rhanidophora phedonia*; 4) *Grammodes exclusiva*; 5) *Grammodes stolidia*; 6) *Grammodes congenita*; 7) *Cuneisigna obstans*; 8) *Tyroca metaxantha*; 9) *Dysgnathia nigropunctata*; 10) unknown; 11) *Plecopterodes moderata*; 12) *Plecoptera sarcistis*; 13) *Fodina* sp.; 14) *Calliodes pretiosissima*. Larger threads on the sheets are 5 mm apart.



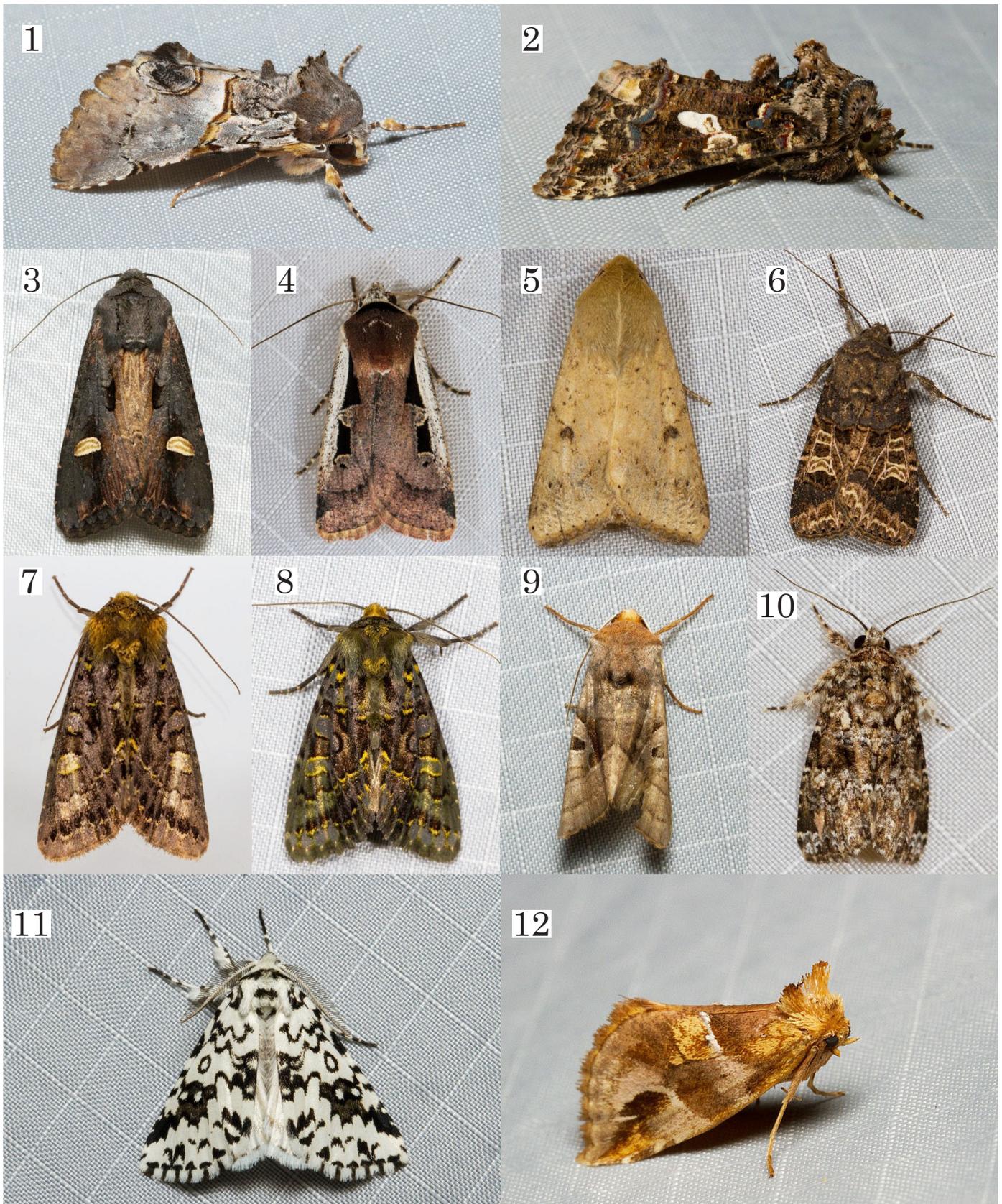
**EREBIDAE:** 1) *Anoba* sp.; 2) *Hypopyra carneotincta*; 3) *Sphingomorpha chlorea*; 4) *Cometaster pyrula*; 5) unknown; 6) *Antiophlebia bracteata*; 7) *Phytometra sacraria*; 8) *Brevipecten cornuta*; 9) *Ogasa nana*; 10) *Eublemma anachoresis*; 11) *Leucotrachea leucomelanca*; 12) unknown; 13) *Ophiusa* sp. Larger threads on the sheets are 5 mm apart.



**NOCTUIDAE: ACONTIINAE:** 1) *Acontia* sp.; 2) *Acontia* sp.; 3) *Acontia* sp.; 4) *Acontia* sp.; 5) *Acontia* sp.; 6) *Acontia hortensis*; 7) *Acontia umbriger*a; 8) *Acontia* sp.; 9) *Acontia guttifer*a. **EUSTROTIINAE:** 10) *Cetola pulchra*; 11) *Eustrotia olivula*; 12) *Maliattha* sp; 13) *Pseudozarba hemiplaca*. Larger threads on the sheets are 5 mm apart.



**NOCTUIDAE:** 1) *Ovios capensis*; 2) *Schausia gladiatoria*; 3) *Sommeria spilosoma*; 4) *Colbusa euclidica*; 5) *Schausia gladiatoria*; 6) *Cryphia fulvifusa*; 7) *Chasmina* sp.; 8) *Ochrocalama xanthia*; 9) *Ethioterpia marmorata*; 10) *Mentaxya albifrons*; 11) *Cucullia hutchinsoni*; 12) *Cryphia* sp.; 13) *Hydrillodes* sp. Larger threads on the sheets are 5 mm apart.



**NOCTUIDAE:** 1) *Thiacidas* sp.; 2) *Thysanoplusia exquisita*; 3) *Brithysana speyeri*; 4) unknown; 5) *Helicoverpa* sp.; 6) unknown; 7) unknown; 8) unknown; 9) *Euplexia augens*; 10) *Callopietria latreillei*; 11) *Trichosea* sp.; 12) unknown. Larger threads on the sheets are 5 mm apart.

## Conservation Matters: Contributions from the Conservation Committee

# Lincoln Brower's legacy of conservation

Robert Michael Pyle

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Lincoln Pierson Brower had established his conservation credentials well before the plight of monarchs came to dominate much of his life, which it did for some forty years. As a professor of biology at Amherst College in 1972 he made the film *Flooding River* about the Connecticut River Valley, which helped to keep it dam-free. His commitment to conservation was life-long, in many areas. In this essay I want to encapsulate Lincoln's long slide into the greatest of his environmental devotions, from which he would never escape until his recent, much-lamented passing to the great milkweed meadow in the sky: protection and perpetuation of the extraordinary biological phenomenon of the North American monarch migration, and the ecological systems that allowed the migration to evolve and continue. Very few know this history, and it deserves to be recorded. I will have to render it concisely, omitting many details. His many colleagues in various aspects of this work may wish to flesh out the story with their own memories, as his scientific collaborators are doing for LPB's vast experimental corpus.

Lincoln and Jane Van Zandt Brower were Society co-founder Charles Lee Remington's first graduate students at Yale, completing their PhDs in 1957. I was soon to become CLR's newest grad student when he organized the 25th annual meeting of the Lepidopterists' Society in San Antonio in 1972 around the theme of "Endangered and Extinct Lepidoptera." I was studying butterfly conservation that year with John Heath in England, and came to the meeting to introduce the new Xerces Society. When I ran into Lincoln between sessions, he gave me a resounding vote of support for Xerces, and we discussed our mutual passion for conservation. Little did we know that we'd soon be collaborating on behalf of monarchs.

Flash forward four years. The Mexican wintering grounds of the monarchs had just been "found" by Fred Urquhart's volunteers Cathy and Ken Brugger at the beginning of 1975. Urquhart's subsequent bombshell article in *National Geographic* announced the fact to the world. Professor Brower approached Professor Urquhart of the University of Toronto in a collegial manner to inquire as to the location, which was deliberately obfuscated in the *Geographic*, so that he might extend his already well-known research on monarch mimicry and chemical ecology to the source. But Urquhart, perhaps leery of the Young Turk moving in on what he saw as his territory, declined to share the location with Brower. So Lincoln and his post-doc Bill Calvert worked it out from the article and maps, and went to Michoacán to see the spectacle for themselves. Thus began the immense Brower-led program of research on the Mexican monarchs, their thermal ecology, biochemistry, energetics,

predation, biomechanics, and various other aspects of their migratory existence.

At the time, I chaired the newly constituted (through Sir Peter Scott's support) Lepidoptera Specialist Group of the Species Survival Commission, International Union for Conservation of Nature. In August, 1976, I convened the first meeting of the LSG at the Fifteenth International Congress of Entomology in Washington, D.C. We were hosted by Dr. Thomas Lovejoy, another former student of Remington's, at the headquarters of World Wildlife Fund—U.S. Lincoln wasn't on the LSG but he applauded our decision to name the migratory monarchs of North America, both the Mexican and Californian wintering subpopulations, as the number one priority in world butterfly conservation, for the perils they could face—logging, fire, development—were already apparent. Subsequently both WWF and IUCN gave a good deal of priority and attention to monarch habitat protection, while also raising money in their name, a strategy we still see today.

As the Brower-Calvert *et al* research effort expanded, understanding grew of the "narrow, knife-edge ecological conditions," in Linc's term, under which this phenomenon evolved and persists. In 1980 LPB moved to the University of Florida, where he would base his monarch research for the next seventeen years. I first visited the monarchs with LPB and Tom Lovejoy in the winter of 1980/81. The first big blizzard that the research team had experienced on Sierra Chincua had just hit, causing heavy mortality and upsetting the early models. My luggage never arrived, so I borrowed long underwear from Tom and a spare sleeping bag from someone else. I arrived with a bad bronchitis from the Mexico City air. I lay back in a foot-thick blanket of frozen monarchs like autumn leaves, beheld the azure sky filled with millions of floating gold doubloons, and I was healed! I loved seeing Linc's sheer delight in being there among *Las Monarcas*, as he learned new facts and asked fresh questions every day, and I loved too being there with the oracle and his dedicated band of assistants. Linc's legendary energy was enough to sustain both of us. Back in Gainesville, Brower's lab, team, and research program only grew.

Xerces, also growing apace, took on its first paid staff in 1983. Melody Mackey Allen was hired first to raise funds for monarch conservation, in 1985 becoming the first full-time Executive Director. Several times she and I traveled down to join Lincoln in Mexico City to meet with the leaders of the Mexican group Pro Monarca, Rodolfo Ogarrio and Fernando Ortiz Monasterio (known as "El Zorro"), and



Left to right: Rodolfo Ogarrio, President of Pro Monarca A.C.; Doctora Leonila Vazquez Garcia of the National Autonomous University of Mexico; her colleague, Hector Perez, & Lincoln Brower, on El Llano de las Papas (Anganguero, Michoacán de Ocampo). Brower is explaining his “string of pearls” concept for protection of the monarchs’ overwintering habitat. Photograph by R. M. Pyle, circa early 1980s.

with many Mexican officials and lepidopterists. It was on one such evening gathering of scientists, in the home of the distinguished lepidopterist Dra. Leonila Vazquez Garcia, that I first heard Brower describe and draw what he called the “string of pearls” plan for protection of the monarchs: an archipelago of strict preserves surrounded by a matrix of forest land to remain mostly intact as buffer zone. And that has been the general approach—though never fully realized—ever since. In order to pursue these objectives and support Pro Monarca, Lincoln, Melody, and I formed the Monarch Project in Xerces, with LPB as Scientific Director, RMP as Chairman, and MMA as Director, doing most of the day-to-day work. Eventually this effort shifted toward Californian monarchs, but the Mexican situation took most of our attention in early years, and continued to do so especially for Lincoln.

On one of our negotiating trips, we were received in the Palacio de Gobernador in Morelia by the Governor of Michoacán, Cuauhtémoc Cardenas, son of Lazaro Cardenas, first president after the revolution. Our talks led to lent helicopters for Brower and Calvert’s reconnaissance, and other material support. Gob. Cardenas loved the forests of his home state. Later he was essentially elected president of Mexico, but not seated, reminiscent to many of Al Gore’s close call in 2000. Had his election been upheld, it might have saved Lincoln a great deal of trouble in eliciting decrees from two successive presidents for the creation and protection of what would become the Monarch Butterfly Biosphere Reserve. These measures always look better on paper than on the ground, but have had major impact nonetheless in reducing depredations on the wintering grounds.

The Monarch Project collaborated with the Lepidopterists’ Society and the Sociedad Lepidopterologica Mexicana to

put on the first conference on monarch conservation and biology (Moncon-1) in Cocoyoc, Morelos, Mexico, in August of 1981. One big obstacle to the meeting’s tri-national goals for cooperative sharing and action was Fred Urquhart’s enmity toward Lincoln Brower, which had erupted into a tempest (chiefly on Urquhart’s part) covered by the *New York Times*, the *Times* of London, and eventually *People*. Urquhart had not taken kindly to Brower’s independent finding of the winter sites, and went on the warpath. As convener, I was tasked with bringing the two scientists together in a spirit of collegiality and common cause on behalf of the animal that we all loved. In the end, we designated them co-chairs, and Fred (in absentia) accepted a silver gavel from Lincoln, tendered with a humble and honorific speech from the podium recognizing Prof. Urquhart’s enormous contributions to monarch studies. Whew! The spirited meeting proceeded peacefully after that, some important early ideas were aired, and the proceedings were published by Xerces in both languages. Moncon-1 has since led to four subsequent Moncons and three important books, each featuring LPB’s latest work with his many colleagues and collaborators, among other contributions.

Next came the *Invertebrate Red Data Book* of IUCN (Wells, Pyle, & Collins, 1983) introducing a new category of red book listing, Threatened Phenomenon, which we applied to the North American migratory monarch system. No one should be surprised to learn that this revolutionary way of defining the problem was an independent brain-child of Professor Brower. It became the driving concept behind the ongoing efforts in both Mexico and California, freeing the issue from the enigmatic fact that the species *Danaus plexippus* itself is not at risk, but its North American migratory system most certainly is. This opened the way for the eventual petition, thirty years later, to list the monarch under the Endangered Species Act, with Lincoln as one of the petitioners. Whether or not the listing comes to pass, this initiative has already led directly to enormous state and federal investment in monarch and milkweed conservation, as LPB suspected it would. Of course these measures will benefit pollinators in general as well.

And so it went, decade by decade, and on into Lincoln’s none-too-quiet retirement at Sweet Briar College with his beloved wife and partner Linda Fink, who was there on Sierra Chincua in that first big blizzard. Working with the World Wildlife Fund, the Monarch Joint Venture, the Michoacán Reforestation Fund, poet-activists Homero and Betty Aridjis and other leaders of Mexican culture and conservation, Gary Paul Nabhan in an initiative called Make Way for Monarchs, and many others, he simply did everything he could to learn, love, and protect the greatest butterfly spectacle on earth. When it became clear that

Monsanto GMO crops, especially Round Up-Ready soy, were eradicating vast tracts of milkweed in the Midwest, he refused Monsanto funding and wrote of the dangers ahead in a monarch issue of *Orion* magazine. He and Linda made friends with novelist Barbara Kingsolver and advised her on monarchs and climate change, ensuring that she got the biology right in her eerily predictive novel, *Flight Behavior*. And ultimately, when three presidents met in their vaunted 2016 “Three Amigos” parley in Ottawa, and among other things, Srs. Trudeau, Obama, and Nieto discussed the future of the monarch of the Americas, this too resulted from the gentle but steady influence of LPB.

As Dr. Chip Taylor, Director of Monarch Watch, recently wrote, “Linc was among the first to recognize that the weakest portion of the monarch’s annual cycle is the formation of the overwintering colonies within the oyamel forests on a few mountain tops in a relatively small region of central Mexico. He saw that protection of these sites was key to the preservation of the monarch migration and he worked tirelessly to safeguard these locations, sometimes earning the wrath of authorities and some colleagues. Yet, he was steadfast in his advocacy.”

Steadfast is the right word, for sure. Linc’s entire existence, trip after exhausting trip, came to orbit this one goal: that the world treasure of the migratory monarchs might survive. Every time he went to Mexico and found still more logging, less forest cover, and fewer monarchs, he called and shared with me of his keen disappointment. But he never lost hope. I could see his famous grin

returning, and his mind ticking over the next research project and the next trip, because the science of these extraordinary insects never ceased to enthrall him, nor their beauty to enchant him; and he knew that real, lasting protection, if it ever came, would depend above all on the science, and the enchantment, together.

As I reflect on fifty years’ involvement in Lepidoptera conservation, I think often and long about Linc, and his life in biology. It was a life of many other dimensions too, a life well lived by any measure and a life abounding in love of family, friends, and the earth itself. And, impelled by that love, it was a life as consequential as any I know for the future of the biota.

The monarchs and their high redoubts among the oyamel firs are not what they were when Lincoln first beheld them. But they are in far better condition, with better prospects, than would have been the case absent the labors of love I have described. In fact, had Brower and Calvert never gone to Sierra Chincua, I suspect the Mexican migration in the main might be lost by now. The migratory monarchs of North America are not safe yet. If they ever truly are, it will largely be thanks to the tireless devotion of Lincoln P. Brower. As Linc loved to say, “We do everything we can to safeguard the Mona Lisa and the Sistine Chapel. How can we do anything less for monarchs?”

(Editor’s Note: Be looking for an additional remembrance and obituary for Lincoln by Anrew Brower, Michael Collins and Ernest Williams in a future issue of the Journal)

## Butterfly wrangler, moth-seeking mountaineer, gold hound -- Ronald Wielgus

Dave Wagner<sup>1</sup> and Daniel Rubinoff<sup>2</sup>

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Ronald S. Wielgus passed away on May 5<sup>th</sup>, 2018 in Tucson, Arizona. He collected both butterflies and moths, including microleps, and was especially familiar with the faunas of Arizona and California. He loved finding a species that had been lost to science, taxa that had eluded others, those that were rare in collections, or that might be undescribed. If a challenge was involved, Ron was your man—the more difficult and obscure, the more his interest would be piqued. Just musing with him about something unknown or of special importance often would spur Ron to action.

Ron grew up and graduated from high school in Chicago in 1951, and then attended the Illinois Institute of Technology College of Architecture, from which he graduated in May 1956. Not long after, he was drafted into the army: boot camp, specialist training, and sent west to Fort Huachuca. He fell in love with Arizona and its biota.

Before all was said and done he would live in Phoenix, Sierra Vista, and Tucson.

Ron always seemed to be all-in on some task or quest, with a laser focus that shifted over the course of time: chasing fritillaries, rearing giant skippers, baiting sesiids, collecting impossibly small moths for Don Davis at the US National Museum, or studying geological maps to find likely spots for staking a gold claim. Later in life, much time would be spent building boats, working on his golf game (and even going so far as to build a chipping and putting green in his front yard), learning to play piano, building a fish pond, taking out said fish pond, enhancing his gardens, and, to the end, planning his next ghost moth campaign.

In his twenties and thirties, he collected fritillaries. For years, he was hell-bent on rediscovering the long-lost



Ronald S. Wielgus. Ron in his early twenties at his drafting table (1956) (left); vicinity Piute Pass in 2010 (right).

(and presumably extirpated) colony of *Speyeria nokomis caerulea* in the Huachuca Mountains west of Sierra Vista, Arizona. Beginning in the late 1960s, his interest in fritillaries started to give way to giant skippers. He developed a remarkable proficiency for finding and raising their larvae, and became an authority on their taxonomy and natural history (eight of his giant skipper publications are listed below). His giant skipper collection, nearly all of which were reared, is deposited at Arizona State University, where his mentor, colleague, and friend, Frank Hasbrouck was the collection curator (although his holotypes went to the Los Angeles County Museum).

Lloyd M. Martin and Noel F. McFarland were other important colleagues; as were F. Martin Brown, Harry Clench, Robert Sternitzky, and Fred Thorne. Ron's closest collecting companions were Frank Hasbrouck, M. A. Petterson, and his children. During the monsoon and summer months, many weekends were spent camping in the mountains with his beloved wife Alyn, and their three children, Dale, Roger, and Jeanne. Even at a young age, the kids were well-seasoned naturalists, adept at finding the day's quarry, and skilled with a net.

It was Hasbrouck who convinced Ron that Microlepidoptera had much to offer as a universe for discovery, especially in the 1970s when the careers of Don Davis, Ron Hodges, and Jerry Powell were in full swing. And, it was Hasbrouck (and later Norman Tindale) who initially turned Ron on to acrolophids and other early diverging lepidopterans.

Perhaps it was one of their shared camping outings that yielded the new *Gazoryctra* from the White Mountains that would later be named after him.

Ron's new ghost moth, restricted to the mountain meadows near Greer, Arizona, is among the most beautiful North American microlepis: a gorgeous pink-orange moth with silvery white markings. Norman Tindale, a world authority on hepialids, was very encouraging of Ron's efforts to assemble a type series, and expressed interest in describing the species after him. The two actively corresponded for years, and eventually contacted DLW to help get the moth described.

With this discovery, Ron's attentions shifted to moth collecting and, with the exception of his backyard faunal surveys, would be focused on microlepis. Ghost moths, in particular, were locked-in as an obsession. Other favored taxa included clearwing moths (Sesiidae), burrowing webworm moths (Acrolophidae), leafminers (various families but especially Gracillariidae), and fairy moths (Adelidae).

Over the last four decades of his life, Ron spent countless hours in the mountains of California and Oregon looking for *Gazoryctra* populations. He was dead set on breaking the life history puzzle of *G. lembertii*, a rare moth known from less than twenty individuals, and only a handful of these from the last hundred years. *G. mcglashani* was another holy grail for Ron. The moth was described from a long series



*Gazoryctra lemberti* (left) and habitat above Piute Pass in Humphrys Basin where Florian Altermatt found a single male *G. lemberti* (or an undescribed sister species) sitting on a rock on 29 August 2006.

from Truckee, California collected by Charles and Ximena McGlashan, but thereafter went missing. Hepialids, especially members of the arctic-alpine genus *Gazoryctra*, were Ron's lepidopterological gold, and a well of endless fascination. Countless nights, most fruitless, spanning more than three decades were given to ghost moth hunts.

Ron's indomitable spirit might be best reflected by the trip he took to the southern High Sierra of California to search for Lember's Ghost Moth in 2010, at age 77. He took it upon himself to make a trip to Piute Pass and Humphreys Basin, where *Gazoryctra lemberti* had been taken in recent years. Ron, all alone, would spend two days and nights near Mosquito Flats, one day and night above 10,000 feet, and one afternoon and night above 11,400 feet. To get all his gear above timberline, Ron built his own pull cart to carry up water, warm clothes, a sleeping bag, and his collecting gear. His family thought he was nuts to even attempt such a climb, by himself, at his age. Was he crazy? No. Obsessed? Almost certainly. Upon his return, unsuccessful but in good spirits, he sent his family and us an email that read, "If you have any doubts about me handling the elevations and the hikes, rest assured that I wasn't winded at all, and I'm in good physical condition. After I reached Humphreys Basin at 11,000+ feet, I walked all over the

terrain looking for hepialids and never felt tired. Unless I'm hit by a car as I cross a street, I think I'll still be around for another go next summer."

Ron thoroughly enjoyed the research and scholarship that could be done with books, in libraries and map rooms, and through correspondence and phone conversations. If something was rare, there was a reason, and usually that reason had to do with some idiosyncrasy about a species' behavior, biogeography, foodplant, soil type, or some other undiscovered factor. Ron was drawn to taxa that had bamboozled others. Days, weeks, might be spent researching and mulling over possibilities, before planning a trip that would validate or dash his hypotheses. His plans for a *Gazoryctra* sweep of the Oregon Cascades and Sierra Nevada for August 2018 were well in place by March, two months in advance of his passing in early May.

He corresponded extensively with F. Martin Brown and L. Paul Grey (fritillaries), Donald R. Davis (adelids, nepticulids, tineoids), Donald Duckworth (sesiids), Ron Leuschner (western moth identifications), Jerry Powell (tortricids), Kilian Rover (megathymids), Norman Tindale (hepialids), DLW (hepialids and leafminers), and DMR (tortricids, saturniids, and sphingids). His detailed letters



Ron, age 77, hiking Humphreys Basin in search of *Gazoryctra lemberti* (left) and his sleeping niche for the night spent above timberline (right). After sunset he wandered grassy areas of the basin hoping to witness the brief dusk-mating flight of *G. lemberti*, described by Lember in correspondence sent to Dyar (1905).

often included maps, pictures, life history notes, and a fair peppering of thoughtful musings about why a species was rare and what should be done to find it. He had a good, upbeat sense of humor, seasoned with sarcasm, and enjoyed banter and bits of bravado, in letter and conversation. We hope to make portions of his correspondence available to others by working with Larry Gall and the Peabody Museum, to get important letters, photos, and notes digitized.

Ron carried out backyard surveys at five of his homes in Arizona and California—these allowed him to learn microleps and other, less charismatic taxa. Through the years when Alyn's health was failing (she suffered from crippling arthritis), Ron's backyard faunal surveys allowed him to collect, correspond with taxonomic authorities, and still provide care for Alyn. His faunal surveys, especially of microleps, got the attentions of Don Davis and Jerry Powell, drew Ron deeper and deeper into Microlepidoptera, and catalyzed and fueled his interests in sesiids, nepticulids, tineids, leafminers, jaw moths, and others.

He was an excellent preparator and mounted thousands of moths, always for some student, research project, curator, or institution. All specimens were labeled and, so much as possible, identified to species—even the smallest micromoths were spread. Interestingly, he did not maintain a private collection—he sent his material off to where he believed his specimens would see greatest use. In this same vein, he did not exchange—once he had zeroed in on a target, he wanted to study it, observe it, collect it, take pictures, record life history notes, meticulously prepare his specimens, and then get these sent off to an active worker or institution. He was exceedingly generous in another fashion; when he learned of a student or researcher with a special need, he was quick to pull up occurrence data and maps to see if he could be of help. Both of us were among those who benefited greatly from his generosity.

Initially, much of his material went to Arizona State University (especially when Frank Hasbrouck was the active curator/collection manager) and the Los Angeles County Museum. His donations formed the foundation for ASU's Lepidoptera collection, and include 20 drawers of

*Speyeria* and five drawers of mostly reared megathymids. Beginning in the 1990s, Ron started sending material to the United States National Museum of Natural History (Smithsonian), especially the primitive moths. Over the last two decades, he also deposited specimens in the Essig Museum of Entomology. Most of his hepialids and leafminers are at the University of Connecticut. Don Davis had this to say about Ron's donations to the United States Museum of Natural History:

“Ron was a tremendous contributor to our National Museum collection of western Lepidoptera. Only a week before he passed away, I had received and was processing one of Ron's latest donations. Because of Ron's efforts and those of others like him, our knowledge of western Lepidoptera has greatly increased. He was truly interested in the diversity of these insects and had devoted much of his life in documenting this diversity. I had the pleasure of meeting him only once at one of our annual Lepidoptera meetings. I only wish that there were more people around the world with Ron's enthusiasm and dedication for understanding the Lepidoptera fauna. Needless to say, he will be greatly missed. Eventually I will be describing a few new species in his honor that he had collected.”

Presently, Don Davis is intending to name both an adelid and an acrolophid after Wielgus, the former with Matthew Medeiros and the latter with Peter Jump. In addition to the three moths mentioned above, we are aware of three additional patronyms—all microlepidopterans:

*Diedra wielgusi* (Clarke, [1991]) (Tortricidae)

*Philonome wielgusi* Sohn and Davis, 2015 (Tineidae)

*Carmenta wielgusi* Eichlin, 1987 (Sesiidae)

After his kids were grown, he mostly collected and camped alone, not because he was a loner—he liked people—but because he was so single-minded when he was on a hunt that there were few that had his will and staying power. It was routine for him to camp three nights for zero or a couple of ghost moths. Rare is rare—and that was his charge. In his later years, his singular quest became finding a new *Gazoryctra* that might be named after Alyn, the love of his



Ron prospecting for gold. Panning for gold on Harshaw Creek, Patagonia Mountains, Arizona, June 1993 (left). Using a high-banker that he designed and built to capture gold at a bedrock outcrop in Ash Canyon, Huachuca Mountains, Arizona, April 1993 (right).

life. (And he may have done so: one of his collections from northern California and another from central Oregon have promise, and are currently being assessed with genetic markers.)

Because he was a self-employed architect, it was possible for him to make time to pursue other interests. Sometime after moving to Arizona, he was bitten by the gold prospecting bug. He had at least two claims, one of which yielded quite a bit of gold, but never enough to trigger a career change. But Ron became so learned over his years of studying geology, maps, historical documents, and hours of hands-on prospecting that he became an authority on searching for gold in the Southwest. From 1992 to 2000, he wrote four booklets on gold prospecting, one of which is still selling well (all are listed below). After returning to Tucson in 2004, at first to escape the interminable rainy winters of his home in Kneeland (Humboldt County, CA), and later to take up permanent residence in 2014, he continued to dabble in prospecting, especially during the Arizona winter, when temperatures for digging were less oppressive.

His passing represents the second major loss of a renowned western lepidopterist in 2018. His long-time colleague and friend, Noel McFarland, passed away in January. Ron was looking forward to attending Noel's memorial service on May 26th, where he could pay his respects to Noel and catch up with old friends, correspondents, and some of the icons of Arizonan lepidopterology. Both Ron and Noel were committed and extraordinarily knowledgeable lepidopterists. Neither is replaceable and they represent unfillable losses in that their runs preceded the onset of the great faunal changes that are befalling the biota of the Anthropocene. It is deeply regrettable that more of their knowledge couldn't be recorded for posterity.

Lepidopterology is fortunate indeed that Ron was such a dedicated, careful, prolific, and generous collector: his specimens in institutions across the United States will be a lasting legacy to entomology, evolution, conservation, climate science, and biodiversity studies.

Many parks and even states (e.g., California, Florida) are making it increasingly difficult to obtain insect collecting permits, especially for amateur insect enthusiasts. Ron's lifetime contributions to systematic biology reveal the short-sightedness of such policies. His weekend efforts made monumental (and some unrepeatable) contributions across many types of biodiversity research, with Dr. Don Davis's assessment above being just one expression of their importance. Wielgus's determined nature, dedication, curatorial follow-through, record of correspondence, and data sharing over the course of five decades, showcases the enormous value of having locals, amateurs, and citizen scientists involved in biodiversity studies. And having *specimens* (not just photographs) in public institutions for scientific study.

Before his passing, Ron asked that his children take his ashes to the montane meadow in the White Mountains where the family spent many weekends seeking the silvered ghost moth that would later bear the Wielgus name. There his spirit and ashes will be joined with those of Alyn's in fields that to the Wielgus family will always be Elysian, recalling days when they were together, had their youth, strong bodies, and time on their side.

\* \* \* \* \*

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# Update on the status of *Citheronia sepulcralis* in the Bahamas (Saturniidae: Ceratocampinae)

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## INTRODUCTION

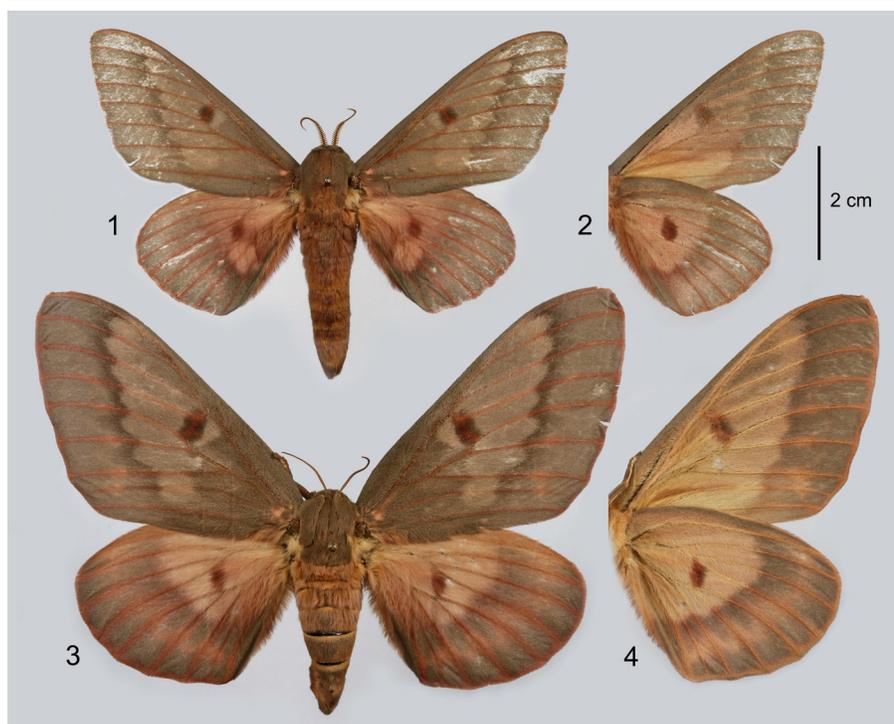
On 26 October 2014, while conducting surveys of Lepidoptera throughout the Bahamas through the National Geographic Explorers Program, we were astonished to encounter a female Pine Devil, *Citheronia sepulcralis* Grote & Robinson, 1865, at our sheet in the vicinity of Barbary Beach on Grand Bahama Island. Three days later we were further surprised when we collected a male on Abaco Island at the Schooner Bay Institute. *Citheronia sepulcralis* adults (Figs. 1–4) are relatively large moths for the region, second in size to the ubiquitous Black Witch, *Ascalapha odorata* (Linnaeus, 1758) (known as Money Bats in the Bahamas) and are thus quite noticeable when they approach lights. In order to ascertain the identity of the species and check for potential genetic isolation from mainland populations of the US, we promptly obtained a CO1 barcode from each of the two specimens and compared these with sequences of mainland populations available on GenBank.

A second trip to Abaco Island in June 2016 resulted in the collection of three more males and two females, including an additional locality. St Laurent (2016) reviewed and mapped distributional data for this species across the eastern US and unaware of our survey material, published a photo voucher from a birding website (Manfredi 2009) as a new, yet unconfirmed, country record for the species. Based on our collections, we confirm that *C. sepulcralis* is well established on these islands since at least 2009.

Larvae of *C. sepulcralis* feed exclusively on *Pinus* (Ferguson, 1971). In The Bahamas, the only *Pinus*, *P. caribaea* Morelet is restricted to Grand Bahama, Abaco, Andros and New Providence islands (Henry 1974, Correll and Correll 1982) and historically occurred on the Berry Islands (Northrop 1902). The species is divided into three varieties, with *P. caribaea* var. *caribaea* on western Cuba, *P. caribaea* var. *hondurensis* (Sénéclauze) W.H.Barrett & Golfari in Central America, and *P. caribaea* var. *bahamensis* (Grisebach) W.H.Barrett & Golfari

on the four western Bahamas islands as well as isolated populations in the Turks and Caicos on Pine Cay, North, and Middle Caicos (Henry 1974). Based on morphology, Nikles (1966) subdivided *P. caribaea bahamensis* populations into two groups (Grand Bahama/Abaco and Andros/New Providence which also correspond with the Little Bahama and Great Bahama Banks respectively).

The absence of Saturniidae in the Caribbean has been a curiosity and thus the discovery in 1944 of an established population of *Automeris io* (Fabricius, 1775) in Nassau (New Providence Island) was particularly noteworthy (Comstock 1946). Our recent surveys have found *A. io* also well-established on North Andros and Great Exuma. While *A. io* feeds on numerous host families and its arrival in The Bahamas, is thought to be human assisted (Comstock 1946), the origin of *Citheronia sepulcralis*, as an obligate pine feeder, merits further consideration and is discussed below.



Figures 1–4. *Citheronia sepulcralis* from South Abaco, Schooner Bay Institute: 1) dorsal view of male, MGCL 238036; 2) ventral view, same specimen; 3) dorsal view of female, MGCL 247503; 4) ventral view, same specimen.

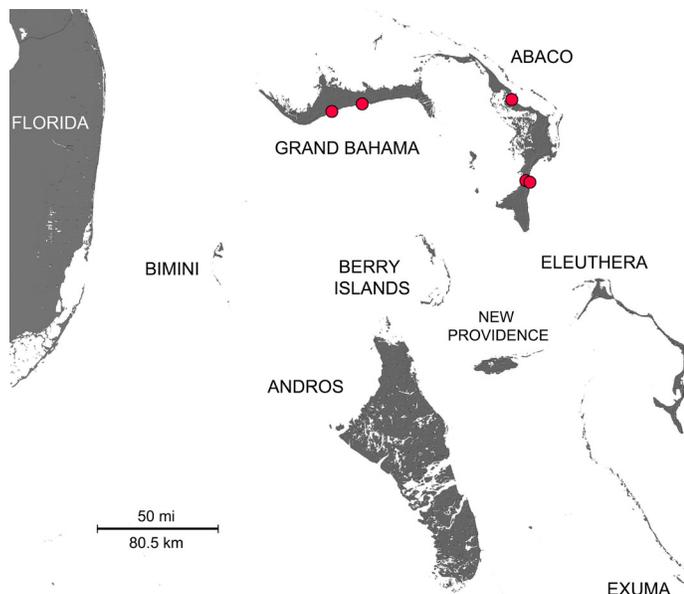


Figure 5. Distribution of *Citheronia sepulcralis* in The Bahamas.

## MATERIALS AND METHODS

Survey material including all Lepidoptera was collected from 2010 to 2016 with a total of 13 islands sampled. In 2014, we covered 11 islands including Grand Bahama and Abaco where *Citheronia* were found (Fig. 5). A second trip was made to Abaco in 2016. Adults were collected at sheets illuminated with a 250 Watt mercury vapor lamp. Islands were generally sampled for up to five days with a different remote location sampled each night and consecutive nightly samples at the Schooner Bay Institute. A leg was removed from each of the two specimens obtained in 2014 and sequenced for CO1 in the Grishin Lab following procedures detailed by Shiraiwa et al. (2014). These sequences, GenBank Accession Numbers MH311296 and MH311297, were compared to those of mainland *C. sepulcralis* specimens available via the public portal of Bold Systems (Ratnasingham and Herbert 2007). Male and female genitalia of Bahamas specimens (1 M, 1 F) were dissected and likewise compared with mainland specimens from Florida and Georgia (3 M, 3 F) available in the McGuire Center collections (MGCL).

## RESULTS

### Specimens Examined

**BAHAMAS: Abaco:** Central Abaco: E side of S.C. Bolle Hwy., 3 mi. S of Treasure Cay Rd., 26.656294°, -77.306661°, 5 Jun 2016, J. Miller, M. Simon, G. Goss, D. Matthews, MGCL Acc. No. 2016-09 (2 M: 1 M, MGCL 247500, 1 M, MJS collection); South Abaco: Schooner Bay Institute, 26.161333°, -77.187667°, 29 Oct 2014, J. Miller, M. Simon, R. Rozycki, D. Matthews, MGCL Acc. No. 2014-31 (1 M, MGCL 238036, DNA voucher LEP-22343); same location, 1 Jun 2016, J. Miller, M. Simon, G. Goss, D. Matthews, MGCL Acc. No. 2016-09 (1 F, genitalia prep. DM 2032, MGCL 247502); same data except 2 Jun 2016 (1 M, genitalia

prep. DM 2031, MGCL 247501); Schooner Bay Institute, vic. power substation, 26.167500°, -77.18900°, 4 Jun 2016, J. Miller, M. Simon, G. Goss, D. Matthews, MGCL Acc. No. 2016-09 (1 F, MGCL 247503); **Grand Bahama:** vic. Barbary Beach, 26.558526°, -78.536983°, 26 Oct 2014, J.Y. Miller, M. Simon, R. Rozycki, D. Matthews, MGCL Acc. No. 2014-31 (1 F, MGCL 238035, DNA voucher LEP-22344).

A neighbor-joining taxon ID tree obtained from BOLD, based on the Kimura 2 parameter (Kimura 1980), including all available *Citheronia* species and *C. sepulcralis* from Maryland, Virginia, Tennessee, and Florida, forms a compact group of *C. sepulcralis* with some non-geographic variability. The two Bahamas samples are very similar and differ in only two positions. The Bahamas specimens are about 1% different from coastal samples. However, the coastal samples themselves show about 1% spread within them. *Citheronia regalis* (Fabricius, 1793), as expected, is the next closest taxon, differing from the *C. sepulcralis* grouping by about 2%.

Examination of male and female genitalia likewise showed no significant differences between the morphology of mainland U.S. populations and our Bahamas specimens. Individual variation was observed across all samples. Of note is variation in the dentation of the posterior margin of female Tergite VII and in males the curvature of the sacular terminus and basal sclerotization of the transtilla. Genitalia are illustrated in part by Packard (1905). Based on wing maculation, morphology of genitalia, and CO1, we confirm the species identity of the Bahamas specimens as *C. sepulcralis* and find no evidence suggesting these populations represent a genetic or morphological segregate.

## DISCUSSION

Knowing *C. sepulcralis* is now established on Abaco and Grand Bahama raises two main questions which cannot yet be answered with any certainty. First, is whether or not it is a native or introduced species. Second, is whether or not it occurs on the other pine islands in the Bahamas/Lucayan Archipelago. Though there are no known records of *Citheronia* in the Bahamas before 2009, lepidopterists have been active in the region in the past. Hampson (1901, 1904) produced a checklist of moths based on the collecting efforts of Bonhote, Neville, Carter, Meers, and others, especially from Andros and New Providence. Subsequent moth publications prior to our more recent surveys (e.g. McCabe 1884, 1992a, b, Miller and Simon 1997, Hayden 2009) are taxon limited but do reflect some collecting activity through the 1980s. Long term monitoring of Bahamas butterfly populations since 1980 (Miller 2018) included collection of macromoths from lights set up in the vicinity of lodging facilities, with North Andros visited on regular basis.

While it seems unlikely a large species such as *C. sepulcralis* would have been missed on Andros and especially New Providence, moth collecting activity on Grand Bahama

and Abaco has been more limited, with scattered material available such as blacklight and malaise traps samples by Steiner and Molineaux in 1987 (USNM collections). So it is possible these large moths have been a part of the Little Bahama Bank fauna for some time without being detected. It is important to note, however, that the island pine forests were heavily exploited for timber, pulpwood, and charcoal from 1906 through the 1970s before all harvest licenses and concessions were relinquished to the government (Henry 1974, Government of the Bahamas 2011). Early licenses restricted harvest to trees of a certain diameter while in the 1950s and 1960s pulpwood extraction allowed for clearcutting, particularly in the 1950s across all of Grand Bahama except for designated "seed bearers" (Henry 1974). The forests of Grand Bahama and Abaco have since regenerated with management studies and legislation in the 1980s, and the Forestry Act of 2010 now provides for sustainable management of all types of forests in the Bahamas (Government of the Bahamas 2018).

Given the past forest exploitation practices, the arrival of *C. sepulcralis* to the Bahamas most likely occurred sometime after the 1970s. In The Bahamas, these moths have been encountered in February (Manfredi 2009), June, and October, indicating multiple broods as in the Southern USA where Brou (1997), for example, detected five emergence peaks in Louisiana (April–September) with most individuals collected in August. As on the mainland, their pest potential is inconsequential and no control measures are recommended at this time. Though likely non-native, this species should be treated as an iconic curiosity and resident naturalists are encouraged to watch for adults at lights as it is a potential inhabitant on all the pine bearing islands.

## ACKNOWLEDGEMENTS

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Please write to me, Marc C. Minno, Membership Coordinator, at [marc.minno@gmail.com](mailto:marc.minno@gmail.com) if you have any questions. Dues may be sent to Jeffrey R. Slotten, Treasurer, 5421 NW 68<sup>th</sup> Lane, Gainesville, FL 32653.

**Society of Kentucky Lepidopterists**

The Society of Kentucky Lepidopterists is open to anyone with an interest in the Lepidoptera of the great state of Kentucky. Annual dues are \$15.00 for the hard copy of the News; \$12.00 for electronic copies only.

The annual meeting is held each year in November, at the University of Kentucky, Lexington. Dates for 2018 are Nov. 9-10. The keynote speaker this year will be Brian Scholtens from the College of Charleston.

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

**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 usually in September. Recent meetings have been joint gatherings with the Southern Lepidopterists Society at the McGuire Center for Lepidoptera & Biodiversity in Gainesville, FL. 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](http://troplep.org) website for further information and a sample journal. Send dues to ATL Secretary-Treasurer, PO Box 141210, Gainesville, FL 32614-1210 USA. We hope you will join us in sharing studies on the fascinating world of tropical butterflies and moths.

**The Ron Leuschner Memorial Fund for Research**

The Lepidopterists' Society has established the Ron Leuschner Memorial Fund for Research on the Lepidoptera. Each year, the Society will fund up to 2+ grants for up to \$500 each to undergraduate or graduate students depending on merit. Applicants must be members of the Lepidopterists' Society. The applications are due January 15 annually and must include submission of the application form, a brief (500 word maximum) proposal, and a letter of recommendation or support from the student's academic advisor or major professor. The application form will be posted on the Lepidopterists' Society website later in 2018. Submit all of the above to Shannon Murphy at [Shannon.M.Murphy@du.edu](mailto:Shannon.M.Murphy@du.edu). Snail mail applications should be sent to Shannon Murphy, Associate Prof., Boettcher West 302, Dept. of Biological Sciences, University of Denver, 2050 E. Iliff Avenue, Denver, Colorado 80208. Successful applicants will be notified by March 15. The review committee consists of members of the Lepidopterists' Society, including the previous year's successful candidates (who are thus not eligible for a new award in the subsequent year's competition). Award recipients will be expected to produce a short report for the committee at the conclusion of their year of funding, which summarizes the positive impact of the award on their research. Recipients must also acknowledge the Fund's support in any publications arising out of the funded work.

This year the Lepidopterists' Society gave 3 students awards from the Ron Leuschner Memorial Fund for Research on the Lepidoptera. The 3 awardees were 1) Nadya Muchoney from the University of Nevada, Reno for her proposal entitled "Evaluating lepidopteran immunity and viral infection frequency in agricultural and non-agricultural areas of California's Central Valley", 2) John Powers from the University of California, Irvine for his proposal entitled "Determining the sensory basis of floral attraction in Hawaiian endemics: which volatile cues produced by *Schiedea* (Caryophyllaceae) attract the crepuscular moth *Pseudoschrankia brevipalpis* (Noctuidae)?" and 3) Ryan St Laurent from the University of Florida for his proposal entitled "Annotated checklist of the Sack-bearer Moths, Mimallonidae (Lepidoptera, Mimallonoidea)." Each student received \$500 to support their research project.

**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](http://www.PayPal.com), and navigate to "Send Money", and use this recipient e-mail address: [kerichers@wuesd.org](mailto: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!

## 2017 Season Summary will be delivered with winter issue of the News

The Season Summary will be delivered with the winter issue of the News. Leroy Koehn apologizes again, but is continuing to deal with important personal issues.

## Call for Season Summary Records

It is once again the time of year to prepare your submissions for the annual Season Summary report. The Chief Season Summary Editor has changed this year, and the format of the final copy may be a bit different in the past, so bear with us during the transition. The Society cannot thank Leroy Koehn enough for his service in this position for many years. The new Chief Coordinators are Brian Scholtens and Jeff Pippens.

Take the time to access the Season Summary database through The Lepidopterists' Society home page (<http://www.flmnh.ufl.edu/lepsoc/>) and do a few searches. The value of the on-line database increases as your data gets added each year. Please take the time to consider your field season and report range extensions, seasonal flight shifts, and life history observations to the appropriate Zone Coordinator. Zone Coordinators, their contact information, and the scope of their zone appears on the inside back cover of every issue of the "News".

There are a number of factors that make it necessary for the Zone Coordinators to meet a reporting deadline each year. As a result, you should have your data to the Zone Coordinator(s) no later than **December 15, 2018**.

All records are important. Reporting the same species from the same location provides a history for future researchers to use. Report migratory species, especially the direction of flight and an estimated number of individuals. Again, all of these records may be useful in the future.

## Season Summary Spread Sheet and Spread Sheet Instructions

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

## Special instructions to Mac Users

When a MAC user sits down to enter the very first record of the season, he/she must create a new Excel file. **Before typing in any data**, go to "Tools", then "Options" or

"Preferences" depending upon your version of Excel, "Calculations", and *uncheck* the 1904 box. Once the data is entered, save this file, and close. If supplemental data is entered directly into this file by keypunching it in, there will not be any problems. However, do NOT paste in MAC data from another file into your file without first ensuring that the 1904 box was *unchecked* in their file PRIOR to entering any of data. Unfortunately, once data has been entered in a file, it does NOT do any good to retroactively *uncheck* the date box!!!

By following these few steps, it is a simple matter to accommodate MAC records. However, you, as the original contributor, must ensure that those steps are taken. Improperly dated records will be rejected and your important records will not get into the database.

## Photographs for Front and Back Covers

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

Brian Scholtens and Jeff Pippens, Co-Chief Coordinators for the Season Summary. (see contact information inside back cover).

## Lep Soc Statement on Diversity, Inclusion, Harassment, and Safety

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

## New MONA Fascicles coming!

The Wedge Entomological Foundation is dedicated to producing volumes in the series "The Moths of North America". Volumes are produced as authors complete them on an anticipated schedule (due to budgetary constraints) of one volume per year, if manuscripts are available.

The governing board members of the Wedge are pleased to announce that there are at least three volumes "in the pipeline" of the Moths of North America series at the present time. The first of these is the Notodontidae Part 1 (see Marketplace), which is to be produced in December 2018. Immediately following this is the Acronictinae volume, and following that is the second volume of the Notodontidae. Thus, 2018, 2019 and 2020 volumes are in the process of production at the present time.

The first volume of Notodontidae presents a monumental work led by James Miller, and with two new genera and eight new species will be a welcome addition to any library. With the research done now on early stages, representations of larval stages are expanded to nine plates.

# The European Peacock Butterfly, *Aglais io* (Linnaeus, 1758) in North America (Lepidoptera: Nymphalidae)

Vazrick Nazari<sup>1</sup>, Louis Handfield<sup>2</sup>, and Daniel Handfield<sup>3</sup>

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*Aglais io* is a widespread Palaearctic butterfly that ranges from Europe to Japan (Higgins & Riley 1970). Described as *Papilio io* by Linnaeus, it was placed under its own monotypic genus *Inachis* by Hübner (1819) and known as such for a long time, until recent molecular evidence suggested the synonymy of *Inachis* with *Aglais* (Wahlberg & Nylin 2003). Beside the nominal subspecies widespread throughout its range, *Aglais io* has two other localized subspecies: *A. io* ssp. *caucasica* (Jachontov 1912) found in the Caucasus mountains, and *A. io* ssp. *geisha* (Stichel 1908) in Japan and the Russian Far East.

The first specimen of *Aglais io* in North America was collected on Île Charron, Québec, on 13<sup>th</sup> of May 1997 by Jacques Leclerc, an amateur collector from Montréal. A female specimen in very good condition was seen basking in the sun with its wings open on a fallen tree trunk in a field near a wooded area before it was captured (Handfield 1999). At the time it was unclear whether this specimen represented a newly established colony, and the proximity to the Port of Montréal suggested rather an introduction. In Europe the butterfly flies as early as February since it spends the winter hibernating as adult, and thus it seemed plausible that a specimen had successfully crossed the Atlantic as a stowaway in a container on a cargo ship.

However, from 1997 to 2008, the butterfly was seen or collected at least six more times by various collectors, all in or around the greater Montréal area: St-Bruno-de-Montarville (1997) (see cover photo), Parc-nature de la Pointe-aux-Prairies (1998), Ville d'Anjou and L'Acadie (2003), Varennes (2006) and Repentigny (2008). Then, after a few years with no new records, it was spotted again in Trois-Rivières (2013) and Pointe-aux-Trembles, Montréal (2014). Since then it has been commonly observed in these areas, as well as in Granby (2016) and Saint-Mathieu-de-Beloeil (2017). There is little doubt that *Aglais io* is now well established in the Greater Montréal area and perhaps even Southwest Québec.

Few records exist outside of Québec. In August 2014, a specimen was photographed feeding on coneflower in a Halifax suburb, possibly an accidental introduction from a cargo ship in the Port of Halifax, Nova Scotia (MBA Newsletter 2015). No other specimens have been seen in the area since. Similarly, a record from Ontario, near Harriston, Minto (Mississauga) in 2014 has remained unique for the province (Layberry & Linton 2015).

In the neighbouring State of New York, a sighting in Staten Island on September 1995 (Gochfeld & Burger 1997) has been followed by the discovery of a dead specimen on January 2013 in a factory near Blodgett Mills in Central New York State (Lotts & Naberhaus 2018). No other specimens are known from New York State.

The butterfly has also been sighted on the West Coast of North America, first from a port in Lane County, Oregon, circa 1985 (Hinchliff 1994, Warren 2005). A recent unpublished sighting from Richmond, BC in October 2017 (Alan Russell, pers. comm.) expands the range of this species into Western Canada (Fig. 1). To our knowledge, no other records or voucher specimens from the West Coast exist, and it is not known whether these records represent accidental introductions or possible establishment of the species in the West.



Figure 1. *Aglais io* photographed in Richmond, British Columbia, October 2017. (photo by Alan Russell)

In Québec, *Aglais io* overwinters and the adults fly from early spring to mid-September. They prefer open, sunny and flowery meadows, usually near woodlands, dry or wet fields and ditches and borders of roads and railways, and especially where there are colonies of Coltsfoot (*Tussilago farfara*) which seems to be its preferred flower for nectaring. The butterfly has also been recorded nectaring on *Buddleia* flowers (Pierre Legault, pers. comm.). Larval hosts include *Urtica* (nettles), especially *Urtica dioica*, but also *Humulus lupulus* in England (Emmet & Heath 1990). In Québec, it is likely to feed on *Urtica procera* (Handfield 2011).

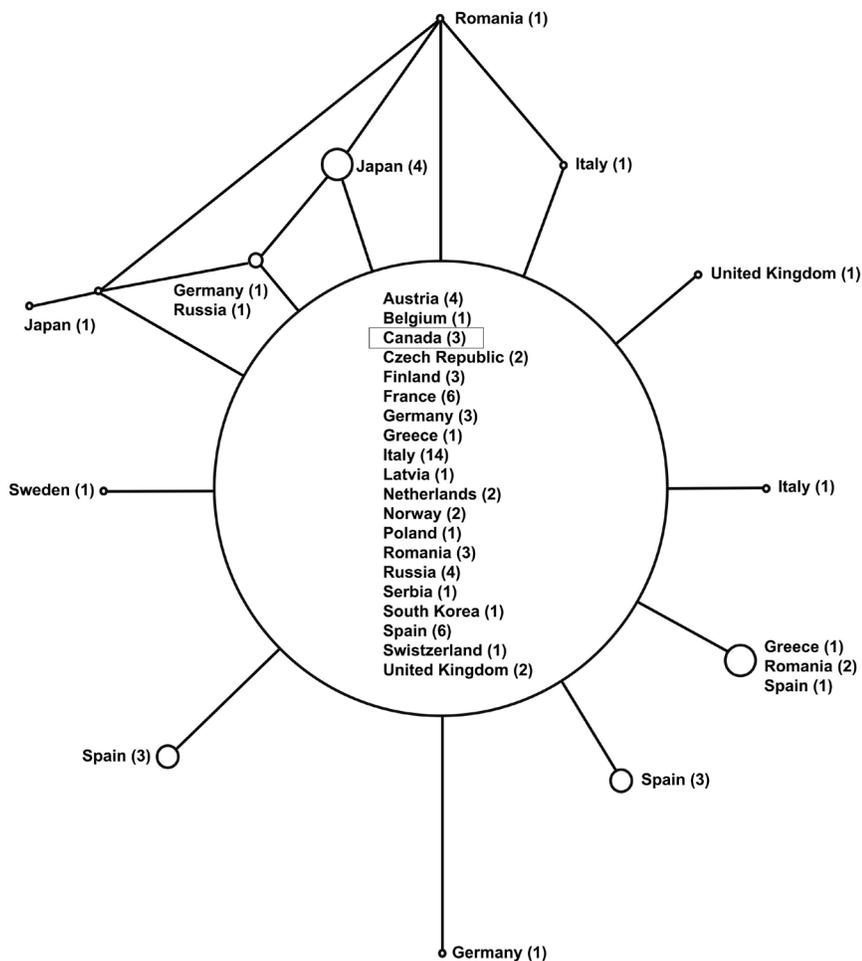


Figure 2. Haplotype network of public DNA barcode sequences of *Aglais io* (via v4.boldsystems.org).

## Molecular analysis

Three Québec specimens were successfully barcoded and yielded full-length (658 bp) COI barcode sequences (BIN BOLD:AAB4921). Using TCS 1.21 (Clement et al 2000), we compared these sequences to other specimens from the entire range of *Aglais io* across the Palaearctic region and found that they matched the most common haplotype, widespread in Europe from Sweden to Spain and from France to Eastern Russia (Fig. 2). Thus, based on DNA barcode data alone it is not possible to determine the origin of the Québec population, although Japan (ssp. *geisha*) can be ruled out. At the time of the capture of the first specimen on Île Charron, one of the authors (LH) searched the records at the Montréal Port Authority and found that a cargo full of containers from Romania had arrived at the port a few days prior. It is possible that this cargo was the source of the introduction.

## Acknowledgements

We would like to acknowledge the contribution of the following amateur collectors and photographers for their records: Jacques

Leclerc and Porfirio Neves (Montréal, QC), André Simard (St-Bruno-de-Montarville, QC), René Boutin (Chambly, QC), Claude Chantal (Varenes, QC), Nathalie Bond (Repentigny, QC), Pierre Legault (Pointe-aux-Trembles, QC), Marie Pouliot (Trois-Rivières, QC), Duff and Donna Evans (Halifax, NS) and Daryl Hutton (Mississauga, ON). We thank Alan Russell (Richmond, BC) and Crispin Guppy (Whitehorse, YT) for information and photo of the BC sighting, Sean Prosser (Guelph, Ontario) for his help in NGS DNA barcoding of one of the QC specimens, and Jean-François Landry (Ottawa, Ontario) for his support.

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# Metamorphosis

*edited by Chris Grinter*

**Peter F. Brussard** (Lepidopterists' Society member since 1970) died at home on May 19, 2018 at the age of 79, less than a mile from where he grew up in Reno, Nevada. He loved this place where the Sierra meets the Great Basin Desert, while lamenting the changes to local ecosystems caused by rapid human population growth. It was a long way back home for him as his life journey took him to universities (Stanford for a BA in history and Ph.D. in Biology, and University of Nevada, Reno for an MS in Biology), to the South Pacific as a Navy officer during the Korean War, and as a faculty member at Cornell University, Montana State University, and finally the University of Nevada Reno.

Pete was an academic whose early research was largely in population biology, where he was a pioneer of using genetic data in analyses of populations. At mid-career, he put his full efforts into his passion for conservation biology. He was one of the founders of the international Society for Conservation Biology in 1985, and part of his legacy is that this organization has grown to more than 4,000 members, and it leads the world in marrying science with action to conserve species, ecosystems, and biodiversity. Pete was awarded the Silver Eagle Award from the U.S. Fish and Wildlife Service as well as the Conservation Award from the Desert Tortoise Council for his roles heading up efforts to recover the grizzly bear in Yellowstone and the desert tortoise in the Mojave Desert. Elected as a Fellow in the American Association for the Advancement of Science because of his excellence in Science, Pete produced more than 150 publications including papers, book chapters, reviews, technical reports, and maps. He also mentored 46 graduate students and postdocs, many of whom went on to be successful scientists and conservation biologists in their own right contributing yet more to knowledge and understanding. In other words, Pete's contributions to his field are being continually magnified by his legacy as an academic and scholar.

Pete always disliked being known as an administrator, but in fact, he was an accomplished administrator. His approach was visionary, transparent to constituents, and fair and inclusive of those for whom he served in a leadership role. He was director of the Rocky Mountain Biological Lab, in Crested Butte, CO, Head of the Department of Biology at Montana State University, in Bozeman, MT, and Chair of the Department of Biology at the University of Nevada, Reno, Reno, NV. During his chairmanship at UNR, Pete was an architect of the renowned multidisciplinary Ph.D. program in Ecology, Evolution, and Conservation Biology, and along with colleague Dennis Murphy and Sen. Harry Reid, he founded the Nevada Biodiversity Initiative, which

led to creating the UNR's Biological Resources Research Center. These new academic and research programs led to dramatic growth of faculty, research, and graduate education in conservation biology. Because of Pete's efforts in assembling a prominent faculty in conservation biology, developing an inventive Ph.D. program emphasizing conservation biology, and initiating infrastructure to support research and action in conservation biology, Paul Ehrlich announced that the University of Nevada, Reno had the best program in conservation biology in the world. This too is part of Pete's legacy.

Among his talents outside of academia, Pete collected and restored literally dozens of antique cars, mostly from the "brass-light" era. Model T Fords were favorites (see picture), and he enjoyed taking his cars on road rallies with friends from antique car clubs. This hobby really made Pete smile.



Pete is survived by his wife Trudy, two sons, Bill and Tad, and daughter-in-law, Chloe. He will be remembered as a person whose impact, personally and professionally, has been etched into history.

*[Contributed by C. Richard Tracy, Reno, NV]*

**Dr. Thomas Chadbourne Emmel, Ph.D.** It is with great sadness that the family of Dr. Thomas C. Emmel announce his passing on Saturday, May 26, 2018, while traveling abroad in Brazil. He was 77 years old.

Tom is lovingly remembered by his brother, John Emmel (Phyllis), his nephew, Travis, and his niece, Alexis. In addition, a multitude of friends, colleagues and former students will forever honor Tom – a noted conservationist, naturalist, prolific author and visionary - for his kindness, humor, encyclopedic knowledge and wide-ranging interests. He epitomized the ideal of the professor as educator, mentor, supporter and inspiration.

Born on May 8, 1941, Tom grew up in Los Angeles, California. His parents, Edward and Ardyce Emmel, met on an outing sponsored by the Sierra Club and encouraged an interest in nature, including taking Tom and his brother on many camping trips to all the national parks in the western U.S. Around age eight, at the suggestion of his father, Tom, then younger brother John, began collecting butterflies on all their family trips. This began a lifelong passion they shared. Their mother further encouraged their interest by driving them to entomological society meetings at Los Angeles County Museum of Natural History. His parents, a den mother and scout master, respectively, were very much involved with the scouting program, and the brothers were Cub Scouts, Boy Scouts, and Explorer Scouts, and became Eagle Scouts as well.

When Tom was a high school senior, he was one of 40 winners of the Westinghouse Science Talent Search, for which he won a trip to Washington, D.C. Upon graduating from high school, Tom went with ornithologist L. Irby Davis, for a three month trip to southern Mexico. Tom assisted Mr. Davis in recording bird songs in the early morning and evening, then collected butterflies during the mid-day. He returned to southern California with several thousand specimens – and his lifetime interest in tropical entomology was secured. As it would turn out, some of those specimens were representative of a new species – which in April 2018 was named *Cyllopsis tomemmeli* in his honor.

Tom earned his B.A. at Reed College in 1963. During the summer breaks from college, Tom was a nature counselor at Sanborn Western Camps for Kids, in Colorado. He earned his Ph.D. in Population Biology at Stanford University in 1967, and was a Post-doctoral Fellow in Genetics at the University of Texas from 1967-1968. His unbridled commitment to and support of the University of Florida began in 1968 when he joined its faculty as Assistant Professor of Biological Sciences & Zoology. In 1973, he became an Associate Professor of Zoology and three years later, in 1976, he became a Professor of Zoology. He



Tom with *Cyllopsis tomemmeli* (photo by Kristen Grace).

served as department chairman for Zoology, directed the Department of Zoology Division of Lepidoptera Research from 1980-2003, and directed the UF Boender Endangered Species Laboratory since its inception in 1995.

In 2004, Tom was chosen to be the Founding Director of the Florida Museum's McGuire Center for Lepidoptera and Biodiversity at the University of Florida. The McGuire Center was Tom's vision and concept: A state-of-the-art research and teaching center that focused on Lepidoptera and the biodiversity they represent, and by extension a facility that engaged the public and created awareness of nature's beauty and relevance to our lives. The Center was brought to fruition by the generous support of Dr. and Mrs. William McGuire, lifelong friends and admirers of Tom and his efforts. Under Dr. Emmel's leadership, The McGuire Center for Lepidoptera and Biodiversity has become world-renowned for research on biodiversity, habitat loss, and Lepidoptera; a major publisher of related scientific studies; a force in public education about our environment and its biodiversity; and the repository for the largest collection of Lepidoptera specimens in the world.

Tom authored more than 400 scientific publications, including 35 books. His many personal research interests included the endangered Schaus Swallowtail population in the Florida Keys and the effects of mosquito control pesticides on non-target wildlife and humans living in south Florida. For over 30 years, Tom studied microevolution, population biology, and ecological genetics of *Cercyonis* butterflies, especially in the state of Colorado. With the help of his life-long friend and research associate, Peter Eliazar, Tom studied chromosome evolution of the worldwide butterfly fauna. Together with his brother John Emmel, Tom worked on biology, life histories, ecology, and conservation of California butterflies, publishing several books on the fauna of that state. Tom was keenly interested in assessing and preserving butterfly diversity in many areas of the world, and worked tirelessly to encourage efforts to promote preservation of natural habitat. His conservation efforts ranged from conserving land in Rondônia, Brazil to creating the Miami Blue--Save Wild Florida license plate initiative, to promoting ecotourism to the overwintering Monarch butterfly sites in Mexico. Throughout his life, Tom mentored countless students, fostering and encouraging their careers in entomology and conservation biology.

Tom leaves behind a tremendous and unparalleled legacy. His vision, imagination, and energy in the service of conservation and Lepidoptera research will continue to inspire and inform future generations of scientists, as well as the general public. His life's work contributed to making the world a better place, and the impact will be enduring.

In lieu of flowers, donations in memory of Tom can be made to the Thomas C. Emmel Founding Director's Endowment, which supports collections and research at the McGuire Center.

# 28 years in Tom's orbit: personal reflections on the passing of Thomas C. Emmel

Andrei Sourakov

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As I left the moving refrigerator of the Greyhound bus and descended into the steam bath of July early afternoon in Gainesville, Florida, I had no idea of what to expect. The year was 1990, and I was visiting a professor of Zoology, Director of the Division for Lepidoptera Research, Thomas C. Emmel, Ph. D. This is how the letter that I had received shortly before that at my home in Moscow was signed. Now, in Russian, "Division" ([divi'zia]) is a military term and means a very large number of armed men and accompanying accessories. So one could imagine from the signature, hundreds of workers on butterflies, which is both frightening and exciting.

The letter I had received from Tom Emmel was in response to my own short communication in an unorthodox but comprehensible version of the English language, in which I outlined my interests in Lepidoptera and my experiences and offered to exchange specimens and literature. In the final sentence, I casually inquired about the possibility of conducting graduate studies "under his guidance." The response was a two-page-long elaborate letter that started with an invitation to apply to the University of Florida graduate program via the Department of Entomology, followed by a detailed description of the University and its program. In the last sentence, Tom casually remarked that should I choose not to come to the University of Florida, we can still exchange specimens and literature.

The free flow of information was not eased by the Internet yet, and I had little idea of what America was like. I was coming from Moscow via New York, Philadelphia, and Washington, where I had short layovers to explore streets and museums, and as I was further descending south, the country looked more and more rural. When the bus stopped at the decrepit Greyhound station east of the University of Florida, little suggested that I was arriving in the "butterfly research capital of the world." By some luck, I found the administrative building, Tigert Hall, where a clerk pointed me towards the Zoology building – a cube-shaped monolith, as if transported for my pleasure from Soviet reality into the American wilderness. I found Tom's office, but he was away at lunch. As I learned later, lunch for Tom was sacred – he never took it alone, almost invariably accompanied by at least one other person to a local restaurant.

As I waited, I read numerous posts on his door. One of them read: **"Going to school to become a lepidopterist? Will you have a job when you graduate?"** "I've heard this before numerous times from my relatives" - I thought – "I hope I did not make such a long journey to hear it again."

When Tom was back from lunch, his mellow benevolent manners very quickly put me at ease. He presented a stark contrast to the intense city dwellers that I was used to. We chatted for half an hour about seemingly unrelated to graduate studies topics. For example, Tom seemed to be fascinated by the fact that I took a Greyhound from New York and was planning to catch another one back to NY that evening – something to which, at the time, I would not have given a second thought. The weekend was approaching, and Tom suggested that we need to move on and take care of the paperwork related to my future graduate studies. This caught me by surprise, as I was expecting some sort of examination of my intellectual merit and knowledge of biology before such a commitment is made on his part.

Instead of taking the bus back that night, I ended up staying the weekend and met Peter Eliazar, Tom's assistant, a Biological Scientist at the Department of Zoology. The two men could not have been more different. Not Hobbits in stature, tall and lean both, they otherwise reminded me a bit of Frodo and Sam from the immortal saga of Tolkien, the way they complemented each other's characters. Peter radiated energy, benevolence, enthusiasm and honesty. While well-read and cultured in matters unrelated to science, he exhibited a great humility and seemed to prefer to lead simpler life, pursuing a PhD more as a hobby than a career move. Peter was also a family man, the father of four, while Tom lived alone with a dog. Unlike Peter, Tom focused on work and the bigger picture and, if one is to judge a man by the contents of his library, had little use for culture outside of the sciences, among which however, his interests were very broad, revolving around natural history and ethnography. Despite or perhaps thanks to their differences, neither of the two men could do without one another. It is thus symbolic that they died within a short period from each other: Peter passed away in December 2017 and Tom followed shortly after in May.

Over the last 28 years, Tom and I collaborated in many ways, from teaching to travelling to planning and running the McGuire Center. I frequently casually threw in ideas, which upon closer examination were completely outlandish. Sometimes Tom would seize upon these ideas and see them through. When I was still in graduate school, I suggested he start a travel company, Expedition Travel, and even helped him organize and lead the first trip. I quickly lost interest and left for a postdoc in San Francisco, but Tom carried on with the venture for years. When he was looking for a publisher for the book he edited on butterflies of the



airfare. Tom however was undeterred and somehow found the money to pay for all the students to go, for some of whom it proved to be a life-changing experience. That year, students nominated Tom for the Honors Professor of the Year, but he never told anyone about this honor that was bestowed on him.

On another occasion, when the LepSoc annual meeting in Alaska fell through, I reminded Tom of the Nature Place in Colorado where we had collected *Cercyonis* butterflies 25 years prior. That area around Pikes Peak had a special significance for Tom, who had started going there in his youth, driven by his passion for the western butterflies and by his interest in population dynamics and the role of butterfly eyespots. The detailed multi-year faunistic study of that place was published by Tom in 1964 when he was a student at Reed College. Already then, Tom must have had significant leadership skills: in his paper, he acknowledges contributions of many children and counselors from the Sunborn summer camps, whom he had enticed into assisting him with the surveys. Before I knew it, Tom put the wheels in motion, and

Plate 1: Tom enjoyed photographing nature and, especially, butterflies wherever he went. Clockwise: Kakamega, Kenya, 1994; Rondonia, Brazil, 1993; Colorado, 1981; Mexico, recently.

American West, I suggested that he publish it himself, and he started a publishing company, which as recently as last year published a book that we used as a textbook for our course, "Insects and Plants," providing them gratis to our students. When we taught the course for the first time, I had the idea that if students were to go to Mexico with one of Tom's groups to see the Monarchs, it would be a great addition to their classroom experience. I wrote to the director of the Honors program through which we were offering the course, but he was able to offer only \$500 travel grants to each student, which would just cover the

though it cost him a lot of effort and money, he made the 2016 LepSoc meeting in Florissant an incredible memory for all who attended.

Despite the efforts Tom put into executing these ideas, and occasional failures, Tom was eternally optimistic, preferring always to focus on the positive and to move on to the next project. As far as costly ideas, he had his own payback with me, as he got me into a number of enterprises that proved to be great sinks of time. One day, three lean tall imposing men whom I knew well, but Tom was not among them, cornered me in my office strongly suggesting that I

should take over editorship of the *Tropical Lepidoptera*, then a rapidly failing journal. I knew Tom was behind it, as he was one of the co-founders of the journal and attributed a great significance to it. Being my "boss" he preferred to send his emissaries, and for the next eight years, I worked on resurrecting the journal, starting with adding "*Research*" to its title, and ending with digitizing its contents and making it freely available via the Internet. As a director of the newly built McGuire Center, Tom wanted to put out a newsletter but his suggestion fell on deaf ears at our staff meetings. One day, he brought me a stack of newsletters from various University of Florida centers and said: "The newsletter does not have to be like one of these, but here are some examples." And that is how I ended up as *McGuire News* editor – another sink of time. That was one of the attractive features of Tom as a supervisor - he never gave any direct orders, instead preferring to make suggestions and encourage activities. If you wanted to do it - great, if not - no pressure. But Tom almost always achieved what he set out to achieve, because he never gave up trying.

One of the big things with Tom was travel. When I first visited Gainesville, in his office and home, I saw the brochures advertising Holbrook Travel trips led by Tom to the most exotic places I ever dreamt of going. There and then I inquired if a graduate student had any chance of joining these tours, and when Tom said "yes," it solidified my decision to come to Gainesville. During graduate school, I participated and even led many of these tours, ranging from Kenya and Ghana to the Solomons and the Dominican Republic. Mark Twain wrote once that "*Travel is fatal to prejudice, bigotry, and narrow-mindedness, and many of our people need it sorely on these accounts. Broad, wholesome, charitable views of men and things cannot be acquired by vegetating in one little corner of the earth all one's lifetime.*" There was certainly none of these flaws in Tom, who was very skeptical of foreign "news" where the US audience can experience only negative facts about the foreign countries, thus supposedly rejoicing in its own safety. But even to Tom, travelling with me to Russia in the early 90s was an eye-opening experience. On one of the Russian trips, Tom gave a couple of lectures at Moscow University and met many amateur and professional entomologists. He visited museums and markets, went to the countryside and even watched me cast a ballot for Yeltsin in the 1996 elections, when the country could have reverted back to the communist rule, but luckily did not. On another occasion, we took a group of collectors to the Far East of the country, where we slept on thin mattresses in an abandoned house, cooked for 15 people on a two-burner electric stove, and could collect right outside the porch. Following that Tom became enamored briefly with the Russian culture, and had at some point four Russian graduate students, and even was elected to the Russian Academy of Natural Sciences. This experience could serve as a great example of people-to-people diplomacy unaffected by meddling (no pun intended) by the governments on the either side.

In general, Tom did not like meddling in his life either, especially frustrated by bureaucracies. On the personal level, he was always trying to break free on his own and away from the dictate of the bureaucracy, and probably would have identified himself as an Objectivist if he ever thought about belonging to any philosophical current. But the closest, as far as I knew Tom, that he got to being philosophical was his participation, along with 60 well-known scientists, 25 of whom were Noble Prize winners, in the *Cosmos, Bios, Theos* project, resulting in the book with the same title, which attempts to reconcile science and religion. Otherwise, Tom preferred to focus on task at hand and relied on individual entrepreneurship and placing trust into individuals rather than institutions. He was also immensely concerned about environment and the future of his favorite creatures, as over his lifetime he witnessed a colossal destruction of habitats throughout the world, which he continued to explore in his many travels.

In his strive for independence and in giving the conservation aspect of his work a distinctive face, Tom created the Endangered Species Lab that was funded in part by his long-time friend and owner of the Butterfly World, Ron Boender. This momentous event happened shortly after I came to Gainesville. Tom placed a modular building on the outskirts of UF campus behind the Entomology Department, while simultaneously retaining his office at Carr Hall, where I met him four years prior. In the new building, there were initially three offices – one occupied by Tom, one by me and one by "the English" - Keith Willmott and Jason Hall, who were working on the butterflies of Ecuador. I met these two youngsters, who, by the way they looked and sounded, could have come off the "Beetles" album cover, on my first outing into the tropics in the summer of 1992 when I had a brief layover at a youth hostel in San Jose, Costa Rica. It turned out that they were planning to go to Gainesville too, perhaps a year after I started there. The driving force behind their move from England to Florida was, not surprisingly, Tom Emmel. For Keith, it constituted an even bigger shift in the direction he was heading previously, as he was a geology student in Cambridge at the time and only an avocational entomologist. Jason was finishing at Oxford. None of us realized at the time the extent of Tom's gravitational pull and that leaving his orbit would be close to impossible. At the time, it seemed that moving to Florida was another short, peculiar adventure, nothing more, with the main attraction of the place being its proximity to the field sites in Latin America.

Soon after the Endangered Species lab was created, it was teeming with activity, especially related to the propagation of the endangered and now-famous Schaus' Swallowtail. The propagation of the species after Hurricane Andrew hit its habitat was spearheaded by another student of Tom, Jaret Daniels. Jaret worked tirelessly on growing plants and caterpillars, and then we would all go to the Florida Keys in May-June. There, if we were lucky, mosquitoes were just emerging together with the Schaus'. If the rains



a couple of days. Similar activity surrounding Schaus' Swallowtail continues today and is still expertly managed by Jaret, now the director of the McGuire Center, but it all had its roots in the stand that Tom Emmel took against the mosquito control industry and for the salvation of butterflies in South Florida many years ago.

In fact, if I can think of one group that did not favor Tom, it is mosquito control folks. From their point of view, a mosquito-free environment meant that they were doing their job well. For Tom, absence of mosquitoes at the cost of butterflies was not worth the benefit. Tom knew well that the effect on non-targets was a weak playing card with the public, so he found another angle – the human health risks resulting from the use of certain pesticides delivered from the airplanes and trucks. As a direct result, the way mosquito control is conducted in Florida today has changed.



All these many students that participated in conservation activities were given free reins when it concerned their own research interests. Tom saw himself more as a facilitator of our work than an advisor in the

Plate 2: Tom with his graduate students in Gainesville, FL, 1995; With the author, Dominican Republic, 1995; Waiting for dinner, local village nr. Kibi, Ghana, 1996; Russian Far East, 1995.

were early, mosquitoes and the swallowtails were already waiting for us. The first year, we had to chainsaw our way through the fallen trees on Elliot Key that were literally leveled by the wind. We marked, released and recaptured the butterflies in an effort to estimate their numbers while frequently wearing full body mosquito protecting gear, patrolling the same trail all day in 90°F heat. The trips were led by the veteran of work in the Keys, Peter Eliazar, who was delightful company; Tom normally came out only for

conventional sense. For that reason he always favored self-motivated students who already knew what they wanted to do. But Tom kept his eye on all the butterfly-related research that was going on worldwide, meticulously subscribing to every possible Lepidoptera journal and buying every book that came out. These were pre-internet days, and hence this resource could not have been underestimated. If one asked Tom a butterfly-related question, next day Tom would bring a pile of reprints and books. He also kept

meticulous notes on his trips, jotting down every little detail in a small pocket-size notebook which, upon need, he would Xerox into full-page instruction sheets for his students to use in their fieldwork. This meticulousness paid off numerous times, and as recently as this year, a butterfly that he collected in 1959 was rediscovered first in the collection from his specimens and then in the field. It was described as a new species, named in Tom's honor, and Tom's field notes played a big role in this rediscovery.

Sometimes I hear that people refer to Tom as a father figure. I don't know about their fathers, but mine, while being very supportive of my entomological pursuits and travels, always worried about the outcome, seeing it as a "non-profession" and fearing presumed dangers of far and unknown places. In this respect, Tom was certainly not a father figure to me, which was very fortunate. At the onset of my PhD work on Hispaniola, I had a stupid idea to track across the Central Cordillera alone and in a straight line. The idea was inspired by Philip Darlington, who was of the opinion that sampling should be done this way to avoid bias created by following man-made roads and passes. So, when Tom and I were driving through the mountains of the Dominican Republic, I asked him to drop me off with my back pack at a convenient locality from which I could venture into the forested mountains, before he left the island. Tom did so without much hesitation, and when I came back to Gainesville a month later, I had lots of stories to tell. On another occasion, when I was still Tom's student, I decided to join another biologist on a 60-day trek through north-western Nepal, collecting along the way. Tom enthusiastically supported the idea, which proved to be one of the most adventurous things I have done.

What took me to Hispaniola was an idea to work on biology and biogeography of the genus *Calisto*, the idea inspired by a conversation a year prior with John Rawlins when I visited Carnegie Museum in 1993. Most of the species of this Caribbean genus can be found in the Dominican Republic. I did not realize that Tom had a lot of experience in that country, that he had his eye on *Calisto* too, and that he even had some specimens he collected that he thought represented a new species. He never indicated this to me while I was his student and as I was working on the genus. He surrendered to me all his reprint files and when many years later, I finally co-authored with molecular biologists a revision of the Hispaniolan *Calisto* and a phylogenetic analysis of the genus, Tom was very complementary. He was very much like other great lepidopterists of the past, Charles Remington being one of them, who had vast knowledge, experience and interests, but saw it much more important to encourage others in their pursuits than to publish their own discoveries. While belonging to the generation who were taught by their parents not to "engage in braggadocio," Tom was very modest about his own work. Instead, he enjoyed bragging about his graduate students and their achievements. I remember a brief time in mid-90s when he had more than 10 graduate students, and was recognized as a distinguished faculty for his mentoring.

The majority of us tend to partition time and activities, at least to some extent, into work and non-work related. For Tom it was all-in-one, and I strongly suspect he did not know how to distinguish the two. Building and running the McGuire Center was for him a new venture that made him realize even more how hard it is to make people see the world his way. But it made him very busy and put him in touch with numerous new people, and he thrived on that. Only by surrounding himself and keeping in constant touch with a variety of like-minded people, and, of course, thanks to having the McGuires on his side, was he able to overcome many difficulties associated with creating the Center. When at some point, on the campus of the University of Florida, the suit-clad administrators began giving speeches about the importance of butterflies for the advancement of humanity, only then did I realize that Tom's seemingly mad dream of the Lepidoptera Research Center could actually materialize.

The ideas behind the McGuire Center for Lepidoptera and Biodiversity were in Tom's mind all along, just like the very personality of Tom always existed unchanged whether it lived in an 8-year old boy hunting butterflies in California, or in a 77-year old man travelling in Brazil. I came across a brochure from the early 80s, where Tom mentions Gainesville as being "a butterfly research capital of the world." When I was a graduate student, he talked about the 1-million-dollar gift he needed to build a Center, and I met people who thought it was a "crazy man's talk." When I left for a postdoc in San Francisco, he would call me at least once a month frequently talking about the possibilities of a gift from this or that prospective donor that would allow building the center. I returned to Gainesville in 1999 and found work at the USDA, where I spent four years doing biocontrol research in Florida vegetable crops. At some point, Tom started inviting me to meetings related to planning of the Center, which were held at various places on campus. The ideas behind the Center were shaping as we went: building on a university campus involves numerous interest groups, and it took a lot of energy and patience on Tom's part to negotiate through 100s of meetings to the successful completion of the building in 2004. The Endangered Species Lab, now an aging trailer with a leaky roof, became headquarters for the Center's planning, with several large tables covered in architectural drawings and construction documentation. Jim Schlachta became Tom's right hand in the process, as, unlike his lepidopterist associates, Jim had an engineering degree and a practical mind. With lots of obstacles overcome, the construction, when started, progressed at an overwhelming pace, and within just over a year, we were ready to move in.

Prior to the opening of the center, Tom acquired a building in downtown Gainesville where, in anticipation of completion, the collections that were moved out of Carr Hall were stored together with some new arrivals. The move from that temporary storage into the 3-story McGuire Center equipped with compactors, elevators and climate control was a delightful, though back-breaking, experience.



The author, Andrei Sourakov, celebrating the life of Tom Emmel at the Lep Soc 2018 meetings at Carleton University in Ottawa, Ontario. (photo by Rajaei Hossein).

Tom always insisted on participating in any physical work, and it took a lot of persuasion to convince him that all this could be done without him. Even more monumental was the task of moving the Allyn Museum from Sarasota. Fortunately, thanks to Tom's foresight, George Austin was already hired as a collections manager and helped to facilitate that move. Shortly after, with the help of Jim and Steve Schlachta, George moved from Nevada with his wife, numerous pets and collection that remains one of the jewels of the McGuire Center. George's collaboration with Tom did not start with the Center. One of the most prolific lepidopterists in history, George had symbiotic relationships with Tom that led to an unparalleled survey of Lepidoptera in Rondônia, Brazil, with numerous new species described and the highest diversity of butterflies in a single spot documented. While George did most of the work related to the survey, it originated, as so many other things, with Tom, who continued to support George's efforts over many years.

Despite moving the Allyn Museum and the Lepidoptera holdings of the FSCA into the new building, the space at the Center seemed vast at the opening, with 77,000 drawer spaces to be filled in the compactors on three floors. The new museum seemed to have a growth space for at least 50 years to come, but, upon the completion of the Center, Tom embarked upon collection acquisition on an unprecedented scale. To give an example, one of collections (and a library) that came from Ulf Eitschberger filled two semi-trucks and weighted 36 tons. By then, my work on the exhibits of the McGuire Center and on moving Florida collections in was done, and I was tasked with accommodating this inflow, which was wrought with problems, as the personnel and the money were always in short supply.

Shortly after, in 2006, with Tom's strong encouragement, we held a LepSoc meeting, whose organization fell largely on the shoulders of Lee and Jackie Miller. The publicity surrounding the McGuire Center was such that the meeting had one of the highest attendances in years, and it may have stimulated the number of collections donated to the Center. Since then, the inflow of the specimens continues at rate averaging around 200,000 per year, with 30-40 accessions (individual donations, large and small) recorded every year. One of the persistent problems has been the availability of drawers which were needed to make a usable single collection out of a number of diverse collections that were arriving in a great variety of differently-shaped containers. It was extremely fortunate that the center was able to hire Keith Willmott as a curator, who by then, from a geology student at Cambridge, had evolved into the world's leading authority on Neotropical Butterflies. With his help and thanks to his reputation, we were able to obtain a grant from the NSF to ensure that the incoming Eitschberger collection of nearly million specimens was integrated. Akito Kawahara, who joined the staff a few years later, insured that the molecular lab and frozen tissue collections received similar adequate NSF support. And even the impact to the center presented by death of George Austin in 2009 was to a great extent absorbed by bringing in Andy Warren as a postdoc shortly prior to that, so that Andy was quickly able to step into George's shoes. Despite seemingly random luck that allowed for the Center to persist through highs and lows, it is largely a result of Tom's vision, who cultivated the environment in which people were given as much, if not more, consideration as the infrastructure.

In an effort to be financially independent from government funding, Tom not only continued with his old ventures, but created additional ones. He never believed anything that he did not want to believe, even if the evidence pointed to the contrary, like the fact that having all these ventures while working for a university may be viewed with skepticism by some. The excellent example of this kind of wishful thinking that served Tom so well over the years is the personal story of my dog Jena. When Tom adopted Jena as a puppy, he was told she was a beagle. But when, to his surprise, she grew into a 60-pound animal - not a great dane, but not a lap dog either - Tom decided it was too much for him to handle as he already had 4-5 smaller dogs. So he said to me, "I have a beagle that I am giving away, in case you know someone." My family went to meet Jena and returned with her, and thus she became our beloved family member. I knew little about beagles, and told my vet that I got one. On my next appointment, when the vet saw Jena he exclaimed facetiously, "That's one huge beagle, man." Jena turned out to be a coon hound, but Tom still called her a beagle despite the evidence to the contrary. The unique ability of Tom to dream and to realize his dreams by making people see the world his way is a great loss to lepidopterology and to the world in general. The void created by his passing will be impossible to fill.

# The Marketplace

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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.

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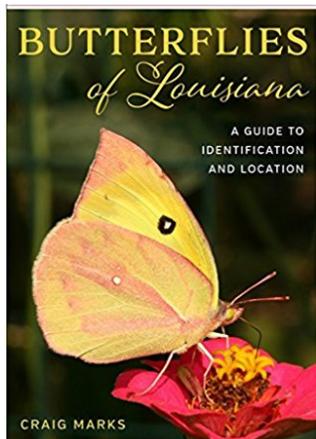
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Publications

**Butterflies of Louisiana** -- by Craig Marks

\$45.00 paperback, 472 pages, 470 color photos, 149 maps, 978-0-8071-6870-7, March 2018

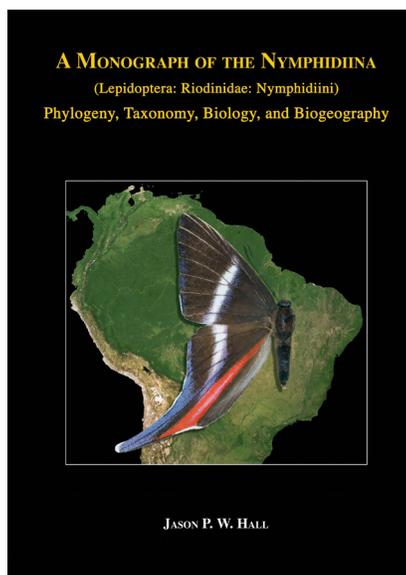


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**A Monograph of the Nymphidiina (Lepidoptera: Riodinidae: Nymphidiini): Phylogeny, Taxonomy, Biology, and Biogeography** -- Jason P. W. Hall.



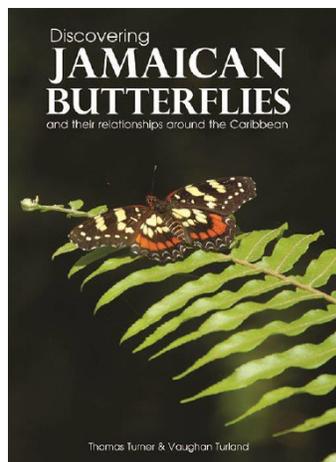
2018. Hard cover, 7 x 10.25 in, 990 pp. (ISBN 978-0-692-98754-4). Published by and available from The Entomological Society of Washington ([entsocwash.org](http://entsocwash.org)). \$125 + postage.

Includes a comprehensive phylogenetic revision of 26 genera (159 species), descriptions of 8 new genera and 11 new species, 39 color plates of spread/live adults, 1121 other figures (cladograms, immatures, genitalia, maps ). See back cover for sample plates. 604

**Discovering Jamaica Butterflies and their Relationships around the Caribbean**

by Thomas Turner and Vaughan Turland

\$147.50 512 pages hardcover, ISBN: 9780692877067, 1021 illustrations. [www.jamaicanbutterfliesmoths.com](http://www.jamaicanbutterfliesmoths.com)



*Discovering Jamaican Butterflies* is a comprehensive, richly illustrated, account of all of Jamaica's 137 butterflies including new discoveries. The **Relationships** between Jamaican butterflies and their closest relatives around the Caribbean are analyzed and the routes over which colonization of the island's butterflies must have occurred are explored in a chapter on **Origins**.

Over 100 life histories are described, usually with color photographs of immature stages and living adults. Other chapters include a brief history of collecting in Jamaica, the preferred **Habitats** and distribution of each species, with a chapter devoted to the **Conservation** of Jamaica's most endangered species. 611

**Rare Books for Sale**

Please: serious, informed inquiries/offers only; to Ernest H. Williams ([ewilliam@hamilton.edu](mailto:ewilliam@hamilton.edu))

Denton, Sherman F. 1900. *Moths and Butterflies of the United States East of the Rocky Mountains*. Boston: Bradlee Whidden. 2 vols. Copy #3 of 500 sets. Half leather, half marbled board, gilded edges; slight shelf wear. Rather than colored images, these volumes contain actual transfers of scales from the wings of specimens.

- Part 1. The Moths, 161 pp. + 13 plates.
- Part 2. The Butterflies, 361 pp. + 43 plates.

Scudder, Samuel Hubbard. 1889. *The Butterflies of the Eastern United States and Canada, with Special Reference to New England*. Cambridge: published by the author. 3 vols. Fine condition; a little shelf wear.

- Vol. I, Introduction, Nymphalidae; xxiv + pp. 1-766 pp.
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The Moths of North America, Fascicle 22.1A, DREPANOIDEA, **Doidae**; NOCTUOIDEA, **Notodontidae** (Part): Pygaerinae, Notodontinae, Cerurinae, Phalerinae, Periergosinae, Dudusinae, Hemiceratinae. By James S. Miller, David L. Wagner, Paul A. Opler, and J. Donald Lafontaine 339 pages, 78 species accounts, 20 colored plates, 23 monochrome plates. Hardbound with dust jacket. ISBN 978-0-9796633-3-8. **Published in 2018 by the Wedge Entomological Research Foundation.** Price \$95.00, plus shipping. An introductory price of \$85.00, plus shipping, is available until December 31, 2018. indefinite

A Checklist of Wisconsin Moths (Superfamilies Mimallonoidea, Drepanoidea, Lasiocampoidea, Bombycoidea, Geometroidea, and Noctuoidea) by Leslie A. Ferge, George J. Balogh and Kyle E. Johnson has been published by the Wisconsin Entomological Society. It treats 1284 species representing thirteen families. Distributions are summarized using the six major natural divisions of Wisconsin; adult flight periods and statuses are also reported. Examples of Wisconsin's diverse native habitat types in each of the natural divisions have been systematically inventoried, and species associated with specialized habitats such as peatland, prairie, barrens and dunes are listed. Four color plates include unusual or seldom illustrated species. It is available online at <http://www.wisentoc.org/publicationslinks/> and hard copies are available for \$13.00 postpaid. Please send check payable to "WI Entomological Society" to Les Ferge, 7119 Hubbard Ave., Middleton, WI 53562-3231. indefinite

## Research

**WANTED:** An adult specimen, either sex, of *Lophocampa roseata* for chemical analysis of the red wing pigment. Observations, photos, specimens of larvae and adults of the Spotted Tussock Moth, *Lophocampa maculata*, and *Lophocampa roseata* from all areas of North America, recent or old data. Records from Alaska and northern Canada, the desert SW, southern Appalachians and Pacific Coast are especially needed to define range. Records of early or late season observations are particularly valuable. All larval and adult photographs are useful, especially if they show unusual patterns of coloration. Specimens are desired for future genetic analysis. Contact Ken Strothkamp, Portland State University ([kstrot2@pdx.edu](mailto:kstrot2@pdx.edu)). 604

**WANTED:** spread, high-quality (i.e., scaled, undenuded) specimens of *Halysidota tessellaris*, *H. harrisii*, and *H. cinctipes* for a study testing the efficacy of new methods of species delimitation. +50 individuals of each sex needed for each species. Specimens will be imaged, have their DNA sequenced, and have their genitalia dissected to confirm IDs. Recently collected specimens (<5-10 years old) preferred. Live specimens greatly appreciated, though not necessary. Donators will be acknowledged in any publications using data derived from specimens, unless they prefer to remain anonymous. For more information please contact Dr. Nick Dowdy of the Milwaukee Public Museum ([njdowdy@gmail.com](mailto:njdowdy@gmail.com)). indefinite

**WANTED:** Specimens needed of *Carmenta ithacae* for DNA analysis and museum specimens (image attached). Will cover postage and will compensate collector ten dollars per specimen for up to 12 individuals. Please contact: William Taft at [billandgussie@earthlink.net](mailto:billandgussie@earthlink.net) for more information or any questions. 604

## Two of our own named Fellows of the Entomological Society of America -- Annapolis, MD; July 30 2018

The Governing Board of the Entomological Society of America (ESA) has elected [the following as] Fellows of the Society for 2018. Election as a Fellow of ESA acknowledges outstanding contributions to entomology in research, teaching, extension and outreach, administration, or the military. [They] will be recognized during Entomology 2018, the Joint Annual Meeting of the Entomological Societies of America, Canada, and British Columbia, November 11-14, in Vancouver, British Columbia, Canada.

### M. Alma Solis, Ph.D.

**Dr. M. Alma Solis**, research scientist and former research leader at the Systematic Entomology Laboratory (SEL), Agricultural Research Service, U.S. Department of Agriculture, was elected as an ES Fellow in 2018. She is internationally recognized as a world authority on the economically important Pyraloidea, or snout moths, and is a curator at the National Museum of Natural History (NMNH), Smithsonian Institution, Washington, DC.



Solis was born in Texas and grew up in Brownsville. She attended Texas Southmost College and transferred to the University of Texas at Austin, where she majored in science education before continuing on to a Master's program in biological sciences with Larry Gilbert. She then went to the University of Maryland at College Park (UMCP) for a Ph.D. program in insect systematics at the Department of Entomology with Charles Mitter. She was hired as a research scientist by SEL in 1989. On a year-long detail in 1999 to the University of Texas at Brownsville, she was associate dean of the College of Math, Science, and Technology. She was appointed acting research leader of SEL in 2003 and as permanent research leader two years later. She briefly served as the ARS acting associate director for the Beltsville Agricultural Research Area in 2011. She was research leader for 10 years, returning to full-time research in 2014.

She has published more than 100 research papers and book chapters on the higher-level classification and

taxonomic identity of ecologically and economically important Pyraloidea. She has conducted fieldwork worldwide, but her primary research focus has been the Neotropics, specifically in Costa Rica. She has been invited to teach workshops on Pyraloidea worldwide. She has provided research services supporting state, federal and international regulatory programs and has provided more than 28,000 identifications during her USDA career.

As SEL research leader, she was the “face” of arthropod systematics research in the federal government and supported university undergraduate and graduate student programs in the U.S and abroad. She has received various awards including the National ARS Administrator’s Supervisory Outreach, Diversity, and Equal Opportunity Award; USDA Recognition for Outstanding Service on the ARS Research Position Evaluation System Advisory Committee; and the USDA Technology Transfer Group Award for providing extraordinary assistance to APHIS/PPQ at ports in the U.S. and around the world. She is a Distinguished Alumnus of the University of Texas at Brownsville/Texas Southmost College and a Leadership Texas alumnus. She is on various scientific and editorial boards and has been president of the ESA Systematics, Evolution, and Biodiversity Section, the Entomological Society of Washington, and the Washington Biologists’ Field Club, where, as noted by *The Washington Post*, she was the first woman president in its more than 100-year history.

She and her husband, Jason P. W. Hall, a butterfly systematist, created a butterfly garden in Silver Spring, Maryland, that was featured by NPR in an interview titled “Rare Specimens: An Unusual Match-Up in Entomology.” At home she is in the garden or reading science fiction and enjoys hiking and scuba diving with her husband.

### Paul Opler, Ph.D.

**Dr. Paul Opler**, a special appointment professor at Colorado State University (CSU), was elected as an ESA Fellow in 2018. He is best known for his research on insect host relationships of Lepidoptera and tropical ecology and his service as first editor of *American Entomologist*.



Opler was born in 1938 in Ann Arbor, Michigan, and raised in Michigan and northern California. He received his B.A. in entomology from the University of California, Berkeley in 1960. Paul continued his education in 1963 at San Jose State University with an M.A. in biological sciences in 1965. He returned to Berkeley and

received his Ph.D. in entomology in 1970. After graduation he was a research associate with the Organization for Tropical Studies in Costa Rica until 1974, after which he was hired by the U.S. Fish and Wildlife Service as the first entomologist in the Endangered Species Program. He retired from the government in 1997 after which he was hired as a special appointment professor in the Department of Bioagricultural Sciences at CSU in 1998.

Opler’s major career accomplishments have centered on his intense interest in Lepidoptera and have resulted in major publications on the species-area effects on leaf-miner species richness of host oak geographic distributions in California as evidenced by highly significant log species versus log host regressions. This should have major effects on the way that economically important crops and their herbivore and parasitoid communities are managed. His books include field guides to both eastern and western butterflies, his contribution to *Moths of Western North America*, and his role as scientific editor of “Status and Trends of our Nation’s Biological Resources.” At CSU, Opler has been major advisor or co-advisor to four students who have completed their advanced degrees. He has given many lectures on Lepidoptera systematics to undergraduate and graduate classes, has helped build the C.P. Gillette Museum of Arthropod Diversity, and is currently active in helping build a library of genomic DNA for North American butterflies.

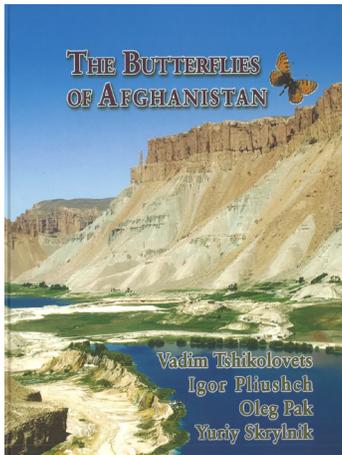
Opler’s major service to the ESA has been his role in serving as first editor of *American Entomologist* and in helping with the enduring format for its contents with significant input from past ESA President W. Donald Duckworth. Paul also served as chair of ESA’s Section A. Opler has been married twice, first to Sandra Sue Segler (1940-1992) and Evi Maria Lang (1950-). His three children are Tim C., David C., and Laura Maria. His hobbies include birding, traveling, genealogy, and paleoanthropology.



Daniel Rubinoff and Chris Schmidt (on the “horse”), at the Lep Soc 2018 BBQ at Lone Star Ranch, SW of Ottawa. I tried to figure out what I should say about this photo, but I’m not sure what caption belongs here. (photo by James K. Adams)

# Book Reviews

**The Butterflies of Afghanistan** by Vadim Tshikolovets, Igor Pliushch, Oleg Pak and Yuriy Skrylnik. 2018. Published by author V. Tshikolovets. 262 pp., 55 color plates. (Currently available from NHBS [UK] [https://www.nhbs.com/] [current price at this writing \$232 US] or from the publisher, located in Pardubice, Czech Republic.) ISBN 978-80-907089-0-7.



A number of years ago we needed fairly fresh material of the high-elevation Pierid *Baltia shawii* for DNA for a phylogenetic investigation. We actually found someone who had recently collected a batch of them in Afghanistan and would sell us a few. The idea of collecting butterflies in Afghanistan in the midst of war, terrorism and chaos seemed far-fetched – but this person

had done it. Now we have a remarkable monograph of the Afghan butterfly fauna based on 8 expeditions mounted by authors Pak, Skrylnik, and Pliushch between 2007 and 2016, and fully detailed in the introductory pages of this book. Tshikolovets has previously published monographs of the butterflies of Pamir, Turkmenistan, Uzbekistan, Tajikistan, Ladakh, Kyrgyzstan, and Pakistan. This extraordinary effort was inspired by the massive 3-volume butterfly fauna of Turkey by Hesselbarth, vanOorschot, and Wagens (1995) (in German). All of these books are very expensive and I have been very fortunate in persuading our University library to purchase them. I check them out and keep them in my office. No one recalls them. I refer to them very often, but sometimes I just gaze longingly at the plates. The high point in the country is 7492m. I don't think there are any resident butterflies there but would not be totally surprised if migrants like *Vanessa cardui* made it up nearly that high once in a while. Who would have predicted 30 years ago that the butterfly faunas of these exotic and mountainous realms would become so accessible, at least on paper?

The greatest significance of this work is that a vast realm of biogeographic, phylogenetic, and evolutionary wonders has been opened up. Who would not want to collect in the Hindu Kush if it were reasonably secure? I, of course, work in the Andes and Patagonia, not in central Asia, but I have been fascinated for decades by the parallels in climate, landscapes, evolution – and butterfly faunas – between those two regions. Areas of bunchgrass steppe generate complex Satyrid and/or Hesperiid faunas. The Southern Cone of South America has its remarkable



The *Karanasa* plate from “The Butterflies of Afghanistan”

Pronophilines; Central Asia has things like *Karanasa* (monographed by Avinoff and Sweadner in 1951 but still full of surprises). The phenotypic convergences between Patagonian Pronophilines and Central Asian Satyrines are just uncanny (though Asia has not produced any silver ones like *Argyrophorus*). Neither region has undergone a major Hesperine radiation--it's as if one gets one or the other but never both. Central Asia is the center of diversity of *Colias*, with the Andes a secondary center. The Andean radiation seems to be much younger than the Asian. For biogeographic reasons there are no South American *Parnassius*. The radiations of Plebeines in the two regions are different though related, as Nabokov inferred many decades ago. There are no *Lycaena* in South America but a wonderful diversity of them in Central Asia. The Melitaeines are richly represented. There is a growing literature on the geohistory of Central Asia, particularly of the Pleistocene, which certainly has had a great influence on speciation there as in the Andes and Patagonia. The possibilities for productive phylogenetic and biogeographic research on these butterflies, many of which are exquisitely beautiful, are virtually unlimited. All one needs is nerves of steel and trustworthy armed guards...

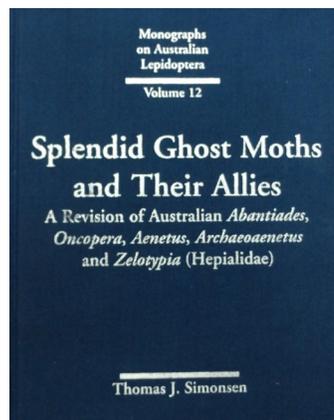
The plates in this book, as with all of Tshikolovets' books, are superb—both the butterflies, which are reproduced life-size, and the habitats. There is relatively little life-history information, which is hardly surprising, but the range maps are generally very useful and the species bibliographies excellent. The authors are not “into” historical-biogeographic reconstruction. They have laid the groundwork for a new generation to do that, if and when conditions on the ground allow, *Inshallah!*

ARTHUR M. SHAPIRO, *Center for Population Biology, University of California, Davis, Davis, CA 05616. amshapiro@ucdavis.edu*

## Literature Cited

- Avinoff, A. and W.R. Sweadner. 1951. The *Karanasa* butterflies, a study in evolution *Annals of the Carnegie Museum* **32(1)**: 1-250.
- Hesselbarth, G., H. vanOorschot, and S. Wagener. 1995. *Die Tagfalter der Tuerkei unter Beruecksichtigung der angrenzenden Laender*. 3 vols. Verlag Wagener, Bocholt.

**Splendid Ghost Moths and Their Allies: A Revision of Australian *Abantiades*, *Oncopera*, *Aenetus*, *Archaeoanetus* and *Zelotypia* (Hepialidae)**, by Thomas J. Simonsen. Monographs on Australian Lepidoptera, Volume 12, CSIRO publishing. 300 pp., 565 figures, 48 color plates. ISBN 978-14-863074-7-4.



I almost wrote a two sentence review of this book: “If you like hepialids, you’ll LOVE this book. Get it!” But I figured you would like a LITTLE more information. Anyone who knows anything about hepialids is aware that Australia is a hotbed of diversity for this group, with some of the largest and most spectacular species in the family found there.

Simonsen has produced a monograph that is remarkable in the detail provided on the included 70 species. These 70 species include 15 newly described, as well as one new genus (*Archaeoanetus*). He painstakingly gathered data from some ~9000 specimens representing these 70 species, from many institutional and personal collections. In the Morphology chapter, he provides detailed descriptions of representatives of each genus, and provides many line drawings, including genitalia of almost every species, as well as some larvae and pupae. Additionally there are several electron micrographs of antennal, scale, and leg structures, as well as a few micrographs of larvae (15 species examined in four genera). In the Biology chapter, using the specimen data, he is able to provide decent phenology and distribution information, and has provided maps for each species. Also in the Biology chapter, he

discusses larval life styles and host associations. Larvae may be typified as leaf-feeders (*Oncopera*), root feeders (*Abantiades*) and stem borers (*Aenetus* and *Zelotypia*; unknown but inferred for *Archaeoanetus*). At least two *Aenetus* species are mycophagous in early instars, and members of this genus are known to feed on at least 41 plant genera in 19 families, including some introduced ornamentals. *Abantiades* larval lifestyles are poorly known, but at least one species (*A. atripalpis*) may be found two meters deep in the soil in association with *Eucalyptus* roots, which allows this species to inhabit dry areas as it is able to get water at that depth. Simonsen provides additional Ecology information in the Biology chapter, including detail on mating behaviour and pheromones and cultural and economic importance (some *Oncopera* are considered pests). Lastly in this chapter, he has a short section on Conservation, where he indicates that, although there are a number of habitat specialists with restricted ranges, not enough information currently exists to understand the conservation status of most species. Most of the range information represents collector density, and so much of the drier and more remote areas of the continent remain underrepresented.

The remainder of the book is on the taxonomy of the group, with a checklist, keys, diagnosis and description of each genus, and species accounts. For each species, he indicates the material examined, distribution and species-specific biology, a diagnosis and (re)description (including detail of the head, thorax, abdomen, and genitalia) of both sexes where known. This is followed by seven pages of references, then by many of the figures previously mentioned, and lastly by 48 outstanding color plates, with most species represented by life-size images.

The book is full of interesting little tidbits. Anyone interested in hepialids is aware of the fact that females are egg broadcasters and can carry very large numbers of tiny eggs. Simonsen shares the story of Tindale having reported on an *Abantiades* female having laid 29,000 eggs, with an additional 15,000 counted upon dissection. Simonsen also has a discussion of related east-west species pairs, particularly for *Aenetus* and *Abantiades*, and the potential evolutionary events that separated them.

If you want me to tell you the short-comings of the book, well, there aren’t many. Figure 70 is a figure on antennal segment variation in different hepialid species. This figure is oddly placed after all other adult body part figures, and is NOT directly referenced under the discussion of the antennae on pages 13-19. But that is about the only thing I could find that was not meticulously organized and expertly presented. I highly recommend this book -- this will become the “go to” book for biology and taxonomy of the largest and most splendid hepialid species of the Australian fauna.

James K. Adams, Dept. of Life Sciences, Dalton State College, Dalton, GA 30720. [jadams@daltonstate.edu](mailto:jadams@daltonstate.edu)

# More on rare aberrations in the Prometheus Moth

Don Adams

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This article is inspired by an article of virtually the same title from Tor Hansen in the winter 2017 issue of this publication. In that article Tor relates his aberrant moth, eclosed April 29 in 2017, was raised from eggs I had donated to him the previous 2016 season. Of course the female moth providing these would have eclosed from my stock that same year raising the possibility she could have been a sibling of my aberrant specimen shown in Figs 1-2 (Fig. 3 is a normal Prometheus male for comparison) and eclosed from my 2015 raised stash on May 30, 2016!



Figs. 4. Normal male *Callosamia angulifera*. (photo by Michael Collins)



Figs. 1-3. Upperside/underside of aberrant male Prometheus, with normal male Prometheus for comparison. (photos by Don Adams)

That having been said, it's clear however that the nature of my aberration is quite different from Tor's female, with mine being a male and showing a remarkable similarity to *C. angulifera* (Fig. 4), a moth I have never raised or even seen a live specimen of. After browsing through my best literature on this subject, I sent photos that same day to many individuals countrywide who I knew have had good experience with Sats, seeking their opinions on exactly what I had here. One knowledgeable respondent replied flat out it was *angulifera*, but Jeff Boettner and Michael Collins both recognized markings which didn't fit this exactly. Additionally, both knew that the larval hostplant had been *Sassafras* which would seem to rule out pure *C. angulifera*.

One tempting theory was that my moth was a *promethea-angulifera* hybrid with genes of *angulifera* having 'invaded' my raised *promethea* stock somehow. My location in W. Bridgewater, Massachusetts is in, what some consider, an area of range overlap for these two species and there are very nearby locations where the hostplant for *angulifera*, *Liriodendron tulipifera*, are located and upon which I can occasionally find cocoons of *C. promethea*. Additionally, Tuskes et al. (1996, pg 196) indicates that "late-calling *promethea* females occasionally attract wild *angulifera* males". Michael has dubbed my moth '*C. angul-prom*' and sent me a list of questions in this regard ...

**Michael:** What is the pedigree? Do you have sibs for comparison?

**My Answer:** Native and local *promethea* moths from my location in se Mass. Possible sibs present in my remaining

cocoon stock have not been kept separate. I always release eclosed males from my stock, and rely totally on being able to have eclosed females call 'wild' males which always works here! I then 'bag' mated females for a couple of hours to recover a dozen or two eggs before releasing these as well.

**Michael:** What were the rearing and incubation conditions?

**My Answer:** Cats were raised outside in sleeves tied over hostplant under whatever conditions the natives were exposed to which I haven't kept careful records of. My raised cats were on either *Prunus serotina* or Sassafras, not Tulip tree although I know *promethea* will also occasionally accept this as a host-plant here.

**Michael:** Any chance of brood confusion between the species?

**My Answer:** Not really: I have never raised *C. angulifera* separately/knowingly. The only chance for this I can see is that a female *promethea* called in a wild *C. angulifera* male AND I missed this entirely somehow, AND offspring cats accept the host-plants I cited above, AND adults may display *angulifera* characteristics. My location is considered by some to be in an area of range overlap for these two species and there are Tulip Trees close by.

**Michael:** Is this an early emergence for your area?

**My Answer:** No. Although the 'eclosure envelope' for *promethea* here, by my account, is very broad and bi-modal; beginning in mid-May (early mode) and extending to mid-July (later mode after a two-three week interval of no eclosures after 'early' mode). This doesn't take into account that for the past decade or two, *promethea* here, from the early bi-modal eclosures, occasionally double-brood extending this eclosure window further into the summer.

**Michael:** I hope you spread this moth and publish an article in the News (and not just post it on the web).

**My Answer:** I have the moth on my spreading board now (Fig. 5), and will take it off in a couple more days for a good pic. I'll use these notes and pics as a foundation for a brief write-up on this and submit to the 'NEWS editor'.

**Regards, mmc**

Overwintered 2015-2016 cocoons were kept outside in wire cages that prevent predation but allow natural exposure to daylight, temperature and humidity. Despite my opinion of overall recent decline of this moth here, raised females eclosed from both bimodal groups as well as females from second brood eclosures have consistently 'called' wild males (Fig. 3) which I can distinguish from reared males I routinely release after marking, and which occasionally have returned to a later eclosed stock female. This fact also



Fig. 5. The odd male *Callosamia promethea* spread. (photo by Don Adams)

helps me conclude, although does not prove definitively, that my 'raising' methods have little or no effect on developmental synchrony with the native population.

As the above discourse demonstrates sadly, after having raised *promethea* moths in southeastern Massachusetts since about 1955 without ever once before encountering such a specimen, my 'data practices' have been rather primitive. This specimen was one of many *C. promethea* from my overwintered stash of cocoons and raised in 2015 as cats on Sassafras.

The female parent of this moth had also to have been from eclosures of my 'raised' moths, but due to the way I manage eclosures, I see a possible way genes of *C. angulifera* could have been introduced. Eclosed female moths are kept in 'calling cages' (See News of Lepidopterists' Society Vol 45, spring 2003) during the mid-late afternoon hours that's typical for calling/pairings of this moth. Male moths from my stash however are released and allowed to fly off if they catch a scent, and my pairings for raising therefore depend mostly on what local native males are attracted. Design of this calling cage allows called males to enter and pair, and I frequently don't pay careful attention to details of the called males. Females are kept long enough for a dozen or two eggs, then released along with the males.

My 'breeding method' of releasing stock males and relying on *promethea* females to call wild males has to and does allow called wild males to have access to and pair with the calling female, hands-off and without my direct involvement. This is accomplished either with the 'calling cage' referenced above which requires that attracted males find one 4-1/2 inch circular opening to enter, or my overwinter/eclosure cages (Fig. 6) where cocoons are kept since these cages are constructed with hardware cloth with open mesh large enough that allows males outside to pair with females inside the cages. In either case, I do not have to be physically present for a pairing to occur.



Fig. 6. Overwintering cage. (photo by Don Adams)

I've raised this moth at the West Bridgewater location for the past 25 years, with the methods described above, and without the introduction of stock from any other location further away than the 'calling range' of pheromone

dispersion. Cocoon finds necessary to have started raising here 25 years ago at this location were also collected locally. Although the discussion thus far demonstrates what I believe to be a feasible pathway for the introduction of *angulifera* genes, perhaps the most likely explanation for this striking aberration is, just as the title implies, a rare aberration. In a writing to me recently, Michael Collins states ... "That male might be an example of a mutant in a regulatory gene that normally produces the melanic phenotype. The result might be an ancestral pattern, normally masked by the dark pigment. So your male may not have anything to do with *angulifera* 'contamination'."

## Literature Cited

- Tuskes, Tuttle, & Collins, 1996, *The Wild Silkmoths of North America*. Cornell Univ. Press. Pg 196, Plate 23.  
Holland, 1903, *The Moth Book*, Doubleday, Page & Company. Plate VIII.

In addition, the article similarly discusses fatty acid and polyamine metabolism. The authors also described unique age related biomarkers, and elucidated regulation of lepidopteran aging muscle.

*Manduca sexta* appears to be a suitable animal model for increasing our understanding of lepidopteran senescing muscle, and for interspecies comparison. Study of muscle senescence in *Manduca* may lead to increased comprehension of aging muscles in humans, including describing geriatric syndromes like frailty which is associated with a constellation of symptoms, including muscle weakness. In addition, bridging entomology and geriatrics may lead to a new field of Geriatric Entomology, in which the focus of entomology is shifted somewhat away from pest control to preserving life and function in humans through healthcare related applications. Of note, *Manduca* is fairly large, hardy, easy to rear on synthetic medium, and breeds well in captivity making it an ideal study tool for medicine.

## The Mailbag . . .

### Can We Merge Geriatrics and Entomology into A Single Field?

Oil and water do not mix, but what about Entomology, and Geriatric Medicine? Can we bring these two fields together for the benefit of both insects and humans? Entomology and Geriatrics may not be considered popular fields, but both are of high importance to mankind. Can we expand the practice of entomology beyond research focusing on controlling agricultural pests, vectors of disease, and forensic science to include emphasizing the value of investigations that supplement, and enhance our understanding of human pathophysiology, and natural history of disease? When we study anatomy of a small caterpillar, pupae in diapause, or imago we may not immediately recognize the comparative physiological similarities between Insecta and *Homo sapiens*. However, might this insufficient understanding be enhanced by the research enterprise? The author of this short letter attempts to encourage such process.

This letter is a reply to "A Procession of metabolic alterations accompanying muscle senescence in *Manduca sexta*," by Wone, B., Kinchen, J, and Kaup, E. The online article was published January 17, 2018 in Scientific Reports. The authors' thesis:

"We provide the first detailed compendium of the metabolic alterations that occur in senescing muscle across the lifespan of *M. sexta*. This compendium will provide mechanistic insights into how these combined alterations progress over time and lead to age-related declines in muscle performance and function."

The article describes age-associated alterations in levels of biotin, and collagen-associated metabolites in aging moths.

## References

- Image. *Manduca sexta* elderly man woman - Google Search. (n.d.). Retrieved from [https://www.google.com/search?q=manduca+sexta+elderly+man+woman&source=lnms&tbn=isch&sa=X&ved=0ahUKEwj3ea-mtncAhXBc98KHfa0CTwQ\\_AUICigB&biw=1280&bih=930#imgrc=wEIWaiVpQOGyoM:&spf=1533585258765](https://www.google.com/search?q=manduca+sexta+elderly+man+woman&source=lnms&tbn=isch&sa=X&ved=0ahUKEwj3ea-mtncAhXBc98KHfa0CTwQ_AUICigB&biw=1280&bih=930#imgrc=wEIWaiVpQOGyoM:&spf=1533585258765)  
Wone, Bernard W. M., et al. "A Procession of Metabolic Alterations Accompanying Muscle Senescence in *Manduca sexta*." *Nature News*, Nature Publishing Group, 17 Jan. 2018, [www.nature.com/articles/s41598-018-19630-5](http://www.nature.com/articles/s41598-018-19630-5).

Samuel K. Williams, III, M.D., 1568 Georgia Avenue, Albany, GA 31705. Volunteer Faculty, Internal Medicine, Philadelphia College of Osteopathic Medicine, Georgia Campus, 625 Old Peachtree Rd NW, Suwanee, GA 30024, [sw56625@gmail.com](mailto:sw56625@gmail.com)

# New host and distribution records for *Leto venus* (Cramer, 1780) (Expوريا: Hepialidae) in South Africa

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<sup>3</sup>Hidden Woods Estate, F40 Plett Airport Rd., Karkerville, Plettenberg, Bay, 6600, South Africa

The exceptional size and brightly contrasting colors of the South African moth *Leto venus* (Cramer, 1780) has long made it a favorite for collectors and more recently also for nature photographers (Fig. 1). It is the only member of its genus and the only southern African species with stem boring larvae. All other southern African ghost moths in the genera *Afrotheora* (7 species), *Antihepialus* (4 species), *Eudalaca* (36 species), *Gorgopis* (30 species), and *Metahepialus* (2 species) are soil dwellers that probably feed on surface vegetation or roots (detailed observations only known for *Eudalaca rufescens* (Hampson, 1910) (Joubert 1975). In spite of its visual prominence, the larval biology of *L. venus* remained unknown for the first 165 years following the original description and illustration by Pierre Cramer (1780).



Figure 1. *Leto venus*. Photo by Colin Ralston. <https://www.ispotnature.org/communities/southern-africa/view/observation/599934/casper-for-tony-with-the-help-of-joyce>

Janse (1939) noted that one family familiar with the insect kept secret details of the life history in order to restrict the commercial market and maintain a high sales value. But at that time it was known that the larvae were stem borers (Janse 1939, 1940, 1942) and the life history was first described by Janse (1945) who identified the host plant as the Keurboom, *Virgilia oroboides* (Berg.) Salter. (Fabaceae), a forest margin pioneering plant (van Wyk 1986). This host species name accepted by Geertsema (1964) and Scoble (1981), although Scoble (1986) later referred to the species as *V. capensis*. Duke and Taylor (1964) also accepted *V. oroboides* as the host plant but expressed uncertainty



Figure 2. Generalized distribution range for *Virgilia oroboides* (blue outline) and *V. divaricata* (red outline), and locality records for *Leto venus* as crimson circles for adult specimens, and blue circles for larval records from *Cyclophia subternata*.

regarding its taxonomic status with respect to another species – *V. divaricata* Adamson. This taxonomic uncertainty was resolved by van Wyk (1986) who designated *V. oroboides* for populations between the town of George and Cape Town, and *V. divaricata* extending east of George to Grahamstown (Fig. 2).

The allopatric *Virgilia* distributions have geographic implications for correctly identifying the host plants relationships of *L. venus*. There are 11 principle locality records (Table 1) that are mostly found between George and Witelsbos where the moth is said to be widespread (Janse 1945). All published rearing localities are from this region which overlaps the distribution range of *V. divaricata*. But recent host plants for *L. venus* in the garden Route Botanical Garden, George are confirmed by Dr. Priscilla Burgoyne and Dr. Niels Jacobsen of the Southern Cape Herbarium as *V. oroboides ferruginea* B.-E. van Wyk (Colin Ralston, pers. comm.). The Waaihoek Mountains record for *L. venus* lies outside the known range of *Virgilia* (van Wyk 1986, Ben-Erik van Wyk pers. comm.) and no *Virgilia* trees were observed in the habitat where the moth was collected (Henning 1994).

In 2015 larvae of *L. venus* were found boring into stems and branches of *Cyclophia subternata* Vogel in Linnaea (Fabaceae) at Hidden Woods Estate and Lennox Farm (Fig. 3-5). Identification of the larvae was further confirmed by rearing an adult moth. This host record is perhaps not surprising as *Cyclophia* and *Virgilia* are both members of the Tribe Podalyrieae (Boatwright *et al.* 2008). *Cyclophia subternata* is widely distributed on southern slopes in well-

Table 1. Locality records for *Leto venus* from web (iSpotnature.org) and literature

Locality	Date of adult	Source
Forrest Hall	-	Janse (1940), Duke & Taylor (1964)
Hidden Woods Farm	larvae	iSpot
Boosmanbos Wilderness Area	February 17, 2016	iSpot, Ethan Newman
Garden Route Botanical Garden	Pupal exuvia	iSpot, Colin Ralston
Knysna, Eastford Private Nature Reserve	March 7, 2017	iSpot, Kyle Underwood
Knysna	-	(Janse 1940)
Lennox Farm	April 8, 2016	iSpot, Stefan Goets
Nature's Valley	March 26, 2016	iSpot, Alexander Rebelo
Saasveld (Tierkop houses)	February 9, 2011.	iSpot, Stefan Goets
Groenkop Forest Reserve	-	(Geertsema 1964)
Tsitsikama	-	(Scoble 1981)
Waaiohoek Mountains (Worcester)	January 27, 1993	(Henning 1994)
Witelsbos	-	(Janse 1945)
Witfontein Nature Reserve	February 21 2017	iSpot Colin Ralson

drained soils between 160 and 1000 m elevation along the coastal mountain ranges of Tsitsikamma, Outeniqua and Langeberg, including the Waaiohoek Mountains (Schutte 1997). The plants at Hidden Woods Estate and Lennox Farm were being commercially grown as honeybush tea (Fig. 6).

Infestation of cultivated plants raises questions about the process of host establishment by *L. venus*. Ghost moth eggs develop on the ground surface under conditions of high humidity. Where early larval development in natural

habitats is well documented, larvae are reported to feed on ground surface plant humus/debris or fungi before transferring to live plants (Grehan 1989). Some surface plant detritus and plant growth, including grass, occurs between honeybush rows and this material may provide suitable habitat for egg and early instar development. It is also possible that larvae may migrate from surrounding vegetation but at Hidden Woods Estate the worst affected areas were furthest from any existing natural forests which suggest that egg deposition occurred within the cultivated areas.

From late 2017 to the present *L. venus* infestations of honeybush plantations have not been a problem. Whether this decline is due to the application of biological insecticides or periodic ecological factors will require further observations over time. The accessibility of *L. venus* to population assessment due to its visible stem boring habit in cultivated and natural habitats makes it a potentially excellent indicator species for assessing ecological change.



Figure 3 (top): Pupal shell of *Leto venus* protruding from branch of *Cyclopia subternata* at Lennox Farm, South Africa; Figure 4 (middle): Larva of *Leto venus* removed from *Cyclopia subternata* at Lennox Farm, South Africa; Figure 5 (bottom): Larva of *Leto venus* within tunnel in *Cyclopia subternata* at Lennox Farm, South Africa. Photos by Geoff Ochse.



Figure 6. Honeybush tea (*Cyclopia subternata*) cultivation at Hidden Woods Estate, South Africa. Photo by Steve Ritkey.

Detailed studies of larval development and ecology are highly desirable, particularly for the poorly known western part of its distribution range. Past characterization of *L. venus* as a monophagous species (Grehan 1989; Nielsen et al. 2000) is clearly falsified as the moth has at least three host plants – *Cyclopia subternata*, *Virgilia divaricata*, and *V. oroboides*.

## Acknowledgments

We thank Anne Lise Schutte-Vlok (CapeNature, South Africa) and Ben-Erik van Wyk (University of Johannesburg, South Africa) for comment and literature, to John Turner (University of Leeds, United Kingdom) for feedback on the manuscript, and to Colin Ralston (Garden Route Botanical Garden, South Africa) for illustration and host plant information.

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# Membership Updates

Chris Grinter

Includes ALL CHANGES received by 16 August 2018. Direct corrections and additions to Chris Grinter, [cgrinter@gmail.com](mailto: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. = redacted by request)*

**Pamela S. Allison:** PO Box 60812, Canyon, TX 79016 ([psallison@earthlink.net](mailto:psallison@earthlink.net))

**Thomas B. Austin:** [address red. by req.] ([tbausti@g.clemson.edu](mailto:tbausti@g.clemson.edu))

**Matthew Beatty:** 1808 Edgewater Beach Rd., Valparaiso, IN 46383 ([mbeatty233@gmail.com](mailto:mbeatty233@gmail.com))

**Anita M. Camacho:** 4106 W San Miguel St, Tampa, FL 33629 ([anita@butterflytampa.com](mailto:anita@butterflytampa.com))

**Richard Cavasin:** [address red. by req.]

**Ty Clark:** [address red. by req.] ([clark.ty@gmail.com](mailto:clark.ty@gmail.com))

**Glenn Fine:** [address red. by req.] ([glenn@gfine.com](mailto:glenn@gfine.com))

**Mary Fowler:** 2127 Faulk Drive, Tallahassee, FL 32303 ([magnoliamary.lime@gmail.com](mailto:magnoliamary.lime@gmail.com))

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**Vincent Maicher:** Nerudova 60, Ceske Budejovice, South Bohemia, 37005 CZECH REPUBLIC ([vincent.maicher@hotmail.fr](mailto:vincent.maicher@hotmail.fr))



Don and Herma Lafontaine at the Lep Soc 2018 BBQ, at the Lone Star Ranch, SW of Ottawa. (photo by James K. Adams)

# 67<sup>th</sup> Lep Soc Meeting News

## Field Trips -- Ranger Steve (Mueller)

Ody Brook Nature Sanc., 13010 Northland Dr., Cedar Springs, MI 49319 [odybrook@chartermi.net](mailto:odybrook@chartermi.net)

Three organized butterfly field trips provided collecting, watching, and photographing opportunities in the Ottawa Canada region on 15 July 2018. Clear hot weather prevailed with temperatures hovering near 30°C (85°F). Appreciation is extended to leaders Rick Cavasin, Peter Hall, and Chris Schmidt.

Independent field excursions by several from 10 - 16 July were collated and provided by Jeff Phippen, Rick Cavasin, Peter Hall. A pre-meeting trip to James Bay led by Maxim Larrivée ventured to the far north 3 - 9 July. Participants of both formal and informal field outings explored a vast variety of habitats.

Table 1 provides a species list for outings during the meeting. Table 2 lists the James Bay discoveries.

In addition to providing Lepidopterists an opportunity to experience species that might not be seen in home areas, field trips are an opportunity to share knowledge as well as discuss ecological and taxonomic quandaries. One quandary that was not completely resolved was the sighting of *Pieris angelika* (Arctic White). That was the best determination but could have been a different white. Some other species were only identified to Genus because identification details were not adequately observed. I omitted those from the tables.

The Eastern/Canadian Tiger Swallowtail hybrid, Pearl/Northern Crescent, and Northern Spring/Summer Azure were examined, discussed, and pondered. New light was shed on the Northern Crescent natural history for me. I considered it to be single brooded but was told they have a second mid-summer brood. I saw fresh adults. I need to work on this puzzle in my home area of Michigan. I find a few N. Crescents in August/September representing a partial late brood. Butterflies always reveal new things and keep us going afield for new discoveries.

I was surprised with the sighting and photograph of the European Common Blue (*Polyommatus icarus*) by Jeff

Phippen (Fig 1). Peter Hall published an account of its arrival to North America in the Lep Soc News in 2007 but I forgot about it. I pulled the issue from the top of my collecting cabinets and reread his article.

It is a joy to look back at old issues. Thank you to newsletters editors that have done fine work sharing member submissions.

A total of 59 species were reported during Lep Soc meeting week. Rick Cavasin listed 52 species for the James Bay trip that include species for each site each day with coordinates. Anyone interested in the detailed listing can contact me by email to receive the list.

Plan to participate in field trips at the 2019 Lep Soc meeting at the UC Davis meeting in July, dates pending.

The key for the localities in the Table are as follows: A -- K&P Trail at Flower Station; B -- Burnt Lands NW of Park; C -- Lusville, Gatineau Park; D -- Lenark, California Rd; E -- Fletcher Wildlife Preserve; F -- Murphy Pt. Prov. Park; G -- Perth Wildlife Reserve; H -- Larose Forest; I -- Mirabel Quebec; J -- Reveler Conservation Area; K -- Lowe Road Extension, SW of Ottawa.



Fig. 1. European Common Blue, *Polyommatus icarus*, Mirabel, Quebec, 16 July 2018. (photo by Jeff Phippen)

**Table 1. Lep Soc Field Trip Sightings/Captures, July 10-16, 2018 -- 62 Species**

Common Name	Scientific Name	A	B	C	D	E	F	G	H	I	J	K
<b>Hesperiidae (16 species)</b>												
Silver-spotted Skipper	<i>Epargyreus clarus</i>	X		X	X	X			X			X
Northern Cloudywing	<i>Thorybes pylades</i>				X		X					
Columbine Duskywing	<i>Erynnis lucilius</i>	X	X	X	X		X					
Least Skipper	<i>Ancyloxypha numitor</i>			X	X							
European Skipper	<i>Thymelicus lineola</i>			X	X	X	X	X	X		X	X
Peck's Skipper	<i>Polites peckius</i>				X		X	X				X
Crossline Skipper	<i>Polites origenes</i>	X	X	X	X	X	X					

Common Name	Scientific Name	A	B	C	D	E	F	G	H	I	J	K
Long Dash	<i>Polites mystic</i>	X		X		X						
Northern Broken Dash	<i>Wallengrenia egeremet</i>			X	X							
Little Glassywing	<i>Pompeius verna</i>			X	X		X					
Delaware Skipper	<i>Anatrytone logan</i>			X	X		X	X			X	
Mulberry Wing	<i>Poanes massasoit</i>								X			
Hobomok Skipper	<i>Poanes hobomok</i>				X							
Broad-winged Skipper	<i>Poanes viator</i>				X				X			
Dion Skipper	<i>Euphyes dion</i>			X					X			
Dun Skipper	<i>Euphyes vestris</i>	X	X	X	X		X	X	X		X	X
<b>Papilionidae (2 species)</b>												
Black Swallowtail	<i>Papilio polyxenes asterius</i>					X					X	
Tiger Swallowtail hybrid	<i>Papilio canadensis/glaucus</i>	X			X		X	X				X
<b>Pieridae (3 species)</b>												
Mustard White	<i>Pieris oleracea</i>	X			X							X
Cabbage White	<i>Pieris rapae</i>	X	X	X	X	X			X		X	X
Clouded Sulphur	<i>Colias philodice</i>	X	X	X	X	X	X	X	X	X	X	X
<b>Lycaenidae (9 species)</b>												
Coral Hairstreak	<i>Satyrium titus</i>				X						X	
Acadian Hairstreak	<i>Satyrium acadica</i>				X		X	X				
Edward's Hairstreak	<i>Satyrium edwardsii</i>			X								
Banded Hairstreak	<i>Satyrium calanus</i>					X	X				X	
Hickory Hairstreak	<i>Satyrium caryaevorus</i>			X			X				X	
Gray Hairstreak	<i>Strymon melinus</i>				X		X					
Northern Spring Azure	<i>Celastrina lucia</i>	X		X	X			X	X			X
Eastern Tailed Blue	<i>Cupido comyntas</i>	X										
European Common Blue	<i>Polyommatus icarus</i>									X		
<b>Nymphalidae (22 species)</b>												
Great Spangled Fritillary	<i>Speyeria cybele</i>	X		X	X		X	X	X		X	X
Aphrodite Fritillary	<i>Speyeria aphrodite</i>	X	X	X	X		X					X
Atlantis Fritillary	<i>Speyeria atlantis</i>			X	X							
Meadow Fritillary	<i>Boloria bellona</i>											X
Silver-bordered Fritillary	<i>Boloria selene</i>											X
Pearl Crescent	<i>Phyciodes tharos</i>	X					X					
Northern Crescent	<i>Phyciodes coeyta</i>	X		X	X		X	X				X
Baltimore Checkerspot	<i>Euphydryas phaeton</i>			X								
Mourning Cloak	<i>Nymphais antiopa</i>			X								
Eastern Comma	<i>Polygonia comma</i>	X		X	X		X	X				
Gray Comma	<i>Polygonia progne</i>	X					X					X
Compton Tortoiseshell	<i>Nymphalis vaualbum</i>	X										X
Milbert's Tortoiseshell	<i>Nymphalis milberti</i>										X	
Mourning Cloak	<i>Nymphalis antiopa</i>	X										
White Admiral	<i>Limenitis arthemis arthemis</i>	X		X	X		X	X				X
Viceroy	<i>Limenitis archippus</i>					X			X			
Northern Pearly Eye	<i>Enodia anthon</i>	X			X		X	X			X	
Appalachian Brown	<i>Satyrodes appalachia</i>						X	X				
Eyed Brown	<i>Satyrodes eurydice</i>	X		X	X			X	X			X
Common Ringlet	<i>Coenonympha tullia</i>											X
Common Wood Nymph	<i>Cercyonis pegala</i>	X		X			X	X				
Monarch	<i>Danaus plexippus</i>	X		X	X	X	X	X	X		X	X

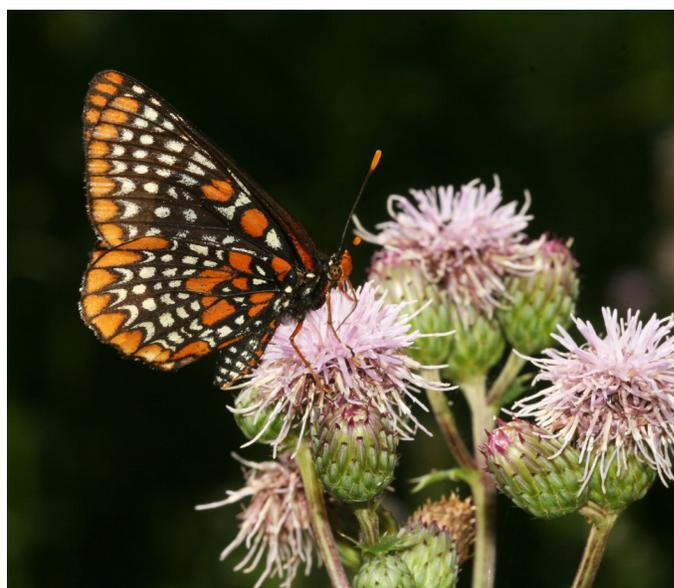
**Table 2. James Bay Field Trip 3-9 July -- 52 Species**

Common Name	Scientific Name
<b>Hesperiidae</b> (13 species)	
Dreamy Duskywing	<i>Erynnis icelus</i>
Grizzled Skipper	<i>Prygus centaureae</i>
Arctic Skipper	<i>Carterocephalus palaemon</i>
European Skipper	<i>Thymelicus lineola</i>
Boreal Branded Skipper	<i>Hesperia comma borealis</i>
Peck's Skipper	<i>Polites peckius</i>
Tawny-edged Skipper	<i>Polites themistocles</i>
Crossline Skipper	<i>Polites origenes</i>
Long Dash	<i>Polites mystic</i>
Northern Broken Dash	<i>Wallengrenia egeremet</i>
Delaware Skipper	<i>Anatrytone logan</i>
Hobomok Skipper	<i>Poanes hobomok</i>
Dun Skipper	<i>Euphyes vestris</i>
<b>Papilionidae</b> (2 species)	
Old World Swallowtail	<i>Papilio machaon</i>
Canadian Tiger Swallowtail	<i>Papilio canadensis</i>
<b>Pieridae</b> (5 species)	
Arctic White?	<i>Pieris angelika</i>
Cabbage White	<i>Pieris rapae</i>
Clouded Sulphur	<i>Colias philodice</i>
Pelidne Sulphur	<i>Colias pelidne</i>
Pink-edged Sulphur	<i>Colias interior</i>
<b>Lycaenidae</b> (11 species)	
Bog Copper	<i>Lycaena epixanthe</i>
Dorcas Copper	<i>Lycaena dorcas</i>
Acadian Hairstreak	<i>Satyrium acadica</i>
Striped Hairstreak	<i>Satyrium liparops</i>

Common Name	Scientific Name
Brown Elfin	<i>Callophrys augustinus</i>
Northern Spring Azure	<i>Celastrina lucia</i>
Eastern Tailed Blue	<i>Cupido comyntas</i>
Silvery Blue	<i>Glaucopyche lydamus</i>
Northern Blue	<i>Lycaeides idas</i>
Greenish Blue	<i>Plebejus saepiolus</i>
Arctic Blue	<i>Agriades glandon</i>
<b>Nymphalidae</b> (21 species)	
Great Spangled Fritillary	<i>Speyeria cybele</i>
Atlantis Fritillary	<i>Speyeia atlantis</i>
Bog Fritillary	<i>Boloria eunomia</i>
Silver-bordered Fritillary	<i>Boloria selene atrostalis</i>
Meadow Fritillary	<i>Boloria bellona</i>
Frigga Fritillary	<i>Boloria frigga</i>
Freija Fritillary	<i>Boloria freija</i>
Silvery Checkerspot	<i>Chlosyne nycteis</i>
Northern Crescent	<i>Phyciodes coycta</i>
Green Comma	<i>Polygonia faunus</i>
Mourning Cloak	<i>Nymphalis antiopa</i>
White Admiral	<i>Limenitis arthemis arthemis</i>
Viceroy	<i>Limenitis archippus</i>
Northern Pearly Eye	<i>Enodia anthedon</i>
Little Wood Satyr	<i>Megisto cymela</i>
Common Ringlet	<i>Coenonympha tullia</i>
Taiga Alpine	<i>Erebia mancinus</i>
Chryxus Arctic	<i>Oeneis chryxus</i>
Jutta Arctic	<i>Oeneis jutta</i>
Melissa Arctic	<i>Oeneis melissa</i>
Monarch	<i>Danaus plexippus</i>



Acadian Hairstreak, *Satyrium acadica*, Perth Wildlife Area, Ontario, Canada, 12 July 2018. (photo by Jeff Phippen)



Baltimore Checkerspot (*Euphydryas phaeton*), Luskville, Pontiac, Quebec, 15 July 2018. (photo by Jeff Phippen)

### 2018 Lep Soc Awards -- James K. Adams

There were a LOT of student presentations this year. The Harry K. Clench awards for student papers (1<sup>st</sup> Place \$500.00, 2<sup>nd</sup> Place \$250.00) were presented to the following: first place went to Ryan St. Laurent for his presentation “The first phylogeny of Mimallonidae, and a revised classification of the family”. There were two second place awards given -- Hanna Royals for her presentation “Revision of *Paralobesia* (Tortricidae: Olethreutinae)”, and Chanchal Yadav for “Mechanisms mediating sociality in caterpillars: Vibroacoustics to sociogenomics.” There were nine student posters overall, and the Alexander B. Klots Awards for those posters (1<sup>st</sup> Place \$350.00, 2<sup>nd</sup> Place \$175.00) were awarded as follows: first place to Mairelys Naranjo for “Ultrasonic courtship songs in the Hooktip Moth (*Drepana arcuata*): A novel way of communication for Drepanoidea,” and second place to Carrie Sun for her poster “Hearing aids’ in butterflies: A comparative study.” Congratulations to all of the winners!!



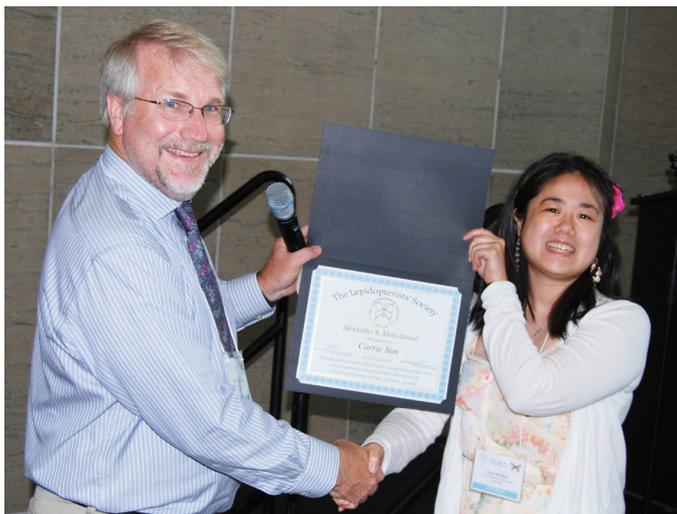
President Brian Scholtens presenting the first place Harry K. Clench Award to Ryan St. Laurent. (photo by James K. Adams)



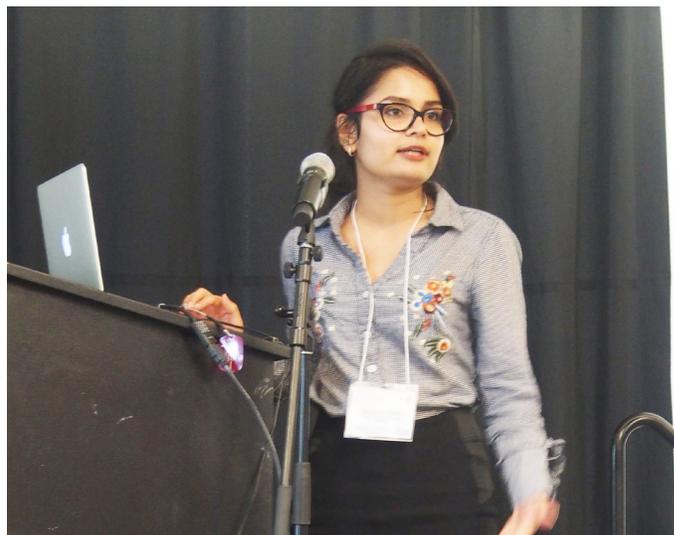
President Brian Scholtens presenting the first place Alexander B. Klots Award for Mairelys Naranjo to her advisor Jayne Yack. (photo by James K. Adams)



President Brian Scholtens presenting one of two second place Harry K. Clench Awards to Hanna Royals. (photo by James K. Adams)



President Brian Scholtens presenting the second place Alexander B. Klots Award to Carrie Sun. (photo by James K. Adams)



Chanchal Yadav, one of two second place Harry K. Clench Award winners, giving her presentation. (photo by Rajaei Hossein)

## Membership

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

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

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	(\$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:

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## Our Mailing List?

Contact Chris Grinter for information on mailing list rental.

## Missed or Defective Issue?

Requests for missed or defective issues should be directed to Chris Grinter. 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  
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## Journal of The Lepidopterists' Society

Send inquiries to:

Keith Summerville  
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[ksummerville@drake.edu](mailto: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/inch<sup>2</sup> 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 Vol. 59 and 60 must reach the Editor by the following dates:

	Issue	Date Due
60	3 Fall	Aug. 15, 2018
	4 Winter	Nov. 15, 2018
61	1 Spring	Feb. 15, 2019
	2 Summer	May 12, 2019

Be aware that issues may ALREADY BE FULL by the deadlines, and so articles received by a deadline may have to go in 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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**Attendees at the joint Lep Soc/SEL meeting, Carleton University, Ottawa, Ontario, Canada, July 10 - 15, 2018.**

All lines front to back. On left: Christi Jaeger, Vazrick Nazari. First Line: Amanda Dookie, Melanie Scallion, Nantasak Pinkaew, Greg Pohl, Ceili Peng, Ben Brack. Second line: Chanchal Yadav, Hanna Royals, Brian Scholtens, Théo Léger, Jim des Rivieres. Third line: Mairelys Naranjo, Sarah Saadain, Thomas Simonsen, Rebecca Allmond, Robert Reed, Oskar Brattström. Fourth line: Carrie Sun, Sora Kim, Ana Carvalho, Thamara Zacca, Ryan St Laurent, Julia Leone (slightly off to right). Fifth line: Laura Carter, Julia Blyth (both kneeling), Bong-Kyu Byun, Jennifer Zaspel, Houhun Li, Alex Baranowski (off to left), Erik van Nieuwerkerken, Kevin Keegan. Sixth line: John Beck, Charley Eiseman (both sitting), Jason Dombroskie, Hae-Ryun Choi, Jean-François Landry, Shuxia Wang, Will Haines, Richard Mally. Seventh line: James Adams (reclined), Aaron Hunt, Rick Cavaasin, Dona Blaine, Matthew Blaine, Dean Morewood. Eighth line: Brittany Harry, David Adamski (off to left), Steve Mueller, Dan Rubinoff (in sculpture). Ninth line: Chuck Harp (kneeling), Charlie Covell, Bernard Landry. Tenth line: Colin Jones, Kuhl Austin, Keith Summerville. Eleventh line: Jose Martinez (sitting), John Snyder, Jessica Linton, Mike Burrell, Ashley Wick. Twelfth line: Annette Aiello, Melissa Lucas, Michael Collins (off to left), Michael Sabourin (hidden), Joseph McCarthy, Chelsea Springs (to Joseph's left), Zdenek Faltynek Fric, Toomas Tammaru. Thirteenth line: John Brown, David Agassiz, Steve Nanz, Hossein Rajaei, JoAnne Russo (to left), Richard Brown (to right), Michael Holy, Reza Zahiri. Fourteenth line: Richard Brown, Jackie Miller, Jeffrey Marcus, Carol Butler (to left), Basil Conlin, Chris Schmidt, Michal Rindoš (to left). Fifteenth line (two people): Kathryn Sullivan (crouching), Alyssa Caywood. Sixteenth line (angled left from front): Jayne Yack, Deborah Matthews, Julia Colby, Erin Campbell, Don Lafontaine, Nick Dowdy, Jim Hayden, Felix Sperling. Last line (three people): Suzette Slocomb, Federico Riva, Mark Walker. I apologize for any misidentifications, and for any misspellings!