Volume 61, Number 3 Fall 2019

NEWS OF THE LEPIDOPTERISTS' SOCIETY

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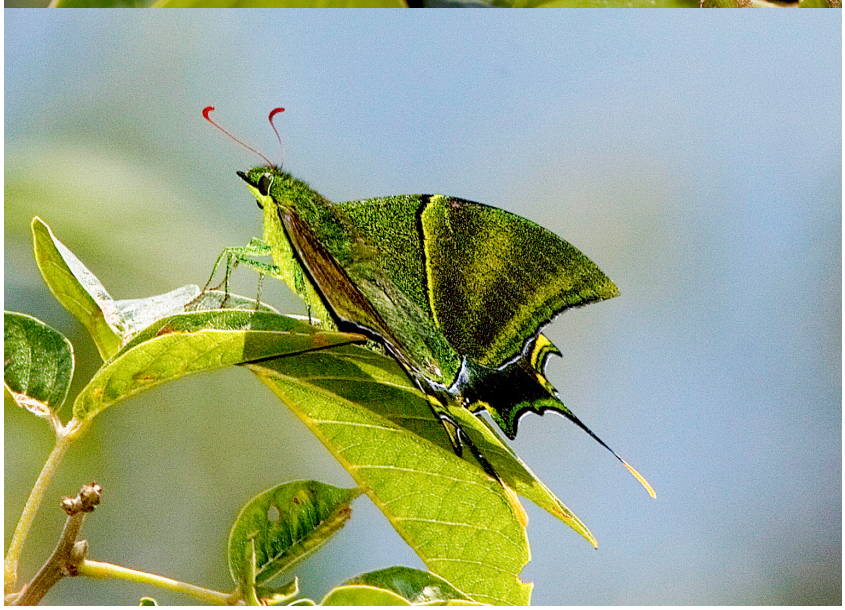

NEWS OF THE LEPIDOPTERISTS' SOCIETY

Volume 61, Number 3
Fall 2019

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.)

The **News of The Lepidopterists' Society** (ISSN 0091-1348) is published quarterly by The Lepidopterists' Society, c/o Chris Grinter, The California Academy of Sciences, 55 Music Concourse Drive, San Francisco, CA 94118, and includes one or two supplements each year. The **Season Summary** is published every year as Supplement S1 and is mailed with issue 1 of the News. In even numbered years a complete **Membership Directory** is published as Supplement S2 and is mailed with issue 4 of that volume of the News. Please see the inside back cover for instructions regarding subscriptions, submissions to, and deadline dates for, the News.

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Issue Date: August 27, 2019 ISSN 0091-1348
Editor: James K. Adams

Front Cover:

Kaiser-I-Hind Butterfly, *Teinopalpus imperialis imperatrix*, Doi Pha Hom Pok Mt., 4-18-2019, 2185m, Chiang Mai District, Thailand. Image by Bill Berthet, see related article on page 111 (facing page).

Mother Nature's majestic mountain top memories: *Teinopalpus imperialis imperatrix*, the Kaiser-I-Hind Butterfly

Bill Berthet

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Delias hyparete

On April 17, 2019 three of Antonio Giudici's Japanese butterfly phtographer friends joined us for dinner in the town of Fang near the Myanmar (Burma) border in far Northwestern Thailand. While sharing their observations of *Teinopalpus imperialis* earlier that morning a gale force wind drew in the striking *Delias hyparete*, that landed on the table next to me. Eating a local dish, fried crispy morning glory leaves, and a bowl of coconut soup filled with vegetables, bamboo shoots, and cubed chicken, I was thinking perhaps this was a sign of good luck.

We had a 5:30 a.m. start the next morning, first stopping at the "huge calories per square foot" 7-11 store, stocking up with 5 bottles of water with powdered electrolytes added, sandwiches, snacks, and a celebratory (hopefully) can of Coke. Antonio drove the winding, hilly, sometimes narrow, paved mountain road, at one point having to remove a clump of bamboos and prod several Brahma cattle that were blocking the road. We reached the Doi Pha Hom Pok campground around 7:00 a.m.

Cattle in the Road

I shouldered my backback, with a long lensed camera and flash, for the 2 hour hike to the 2185m summit, to search for the hilltopping *T. imperialis*. Antonio guided us through a maze of up and down, rocky, slippery, sometimes narrow and very steep trails, winding through open hot and sunny to slightly cooler closed canopy forest.

Trail

With heart pounding, heavy breathing, aching calf and thigh muscles, we took numerous stops to wipe sweat off face and head with a cloth already sopping wet from sweat. We finally reached the open canopy summit, a modified rectangular shaped area around 100m wide by about 200m long, surrounded on three sides by forest including *T. imperialis* host tree *Magnolia campbellii*, and one side with an uneven narrow path bordered by a 5 to 6 foot high thicket of shrubs, sloping down into an open canopy. The open view revealed a massive, multi-tiered, hazy, forested range of mountains that bordered Myanmar (Burma).

The trail opening up on top

The open view of forest and mountains

The next 2 hours we were entertained by up and down, gliding, rapid, erratic, chasing and daisy chaining flights of *Sumalia daraxa, Parasarpa houlberti, Charaxes dolon, Delias belladonna, Papilio arcturus, Graphium cloanthus*, huge bees, the bullies of the group *Meandrusa lachinus*, and around 8 male *T. imperialis* (see front cover as well), zipping back and forth almost faster than the eye can follow, in the open area bordered by the forest on three sides. Meanwhile I photographed *Heliophorus brahma* and *H. evanta* and observed the upward spiral of three bright orange colored dogfighting skippers, that split at the top of the spiral like a Blue Angles plane maneuver.

The first *T. imperialis* appeared after about a 1 ¼ hour wait. The swallowtail landed on the hedge about 8 feet away from the dirt path. Both Antonio and I fired away, and I got off 6 clicks before the butterfly took off. A sense of relief entwined with powerful euphoric feelings flooded through my body. I yelled at the top of my voice "Yes"! Smiling I thanked Antonio for this opportunity, then popped open the celebratory can of Coke, handing it to Antonio for the first sip. 10 minutes later the second *T. imperialis* landed about 6 feet away. As I clicked away I yelled to Antonio, who also got a number of clicks as well, again before the butterfly flew away. We stayed until 11:15 am when the butterflies' morning activities wound down. We headed back down the mountain, completely satisfied.

Sumalia daraxa

The Golden Commodore *Parasarpa houlberti*

The Stately Nawab, *Charaxes dolon*

The Hill Jezebel, *Delias belladonna*

The Glassy Bluebottle, *Graphium cloanthus*

The Blue Peacock; *Papilio arcturus*

The Kaiser-I-Hind Butterfly, *Teinopalpus imperialis imperatrix.*

Heliophorus brahma (left) and *Heliophorus evanta* (right)

Digital Collecting:

The moths of Australia, part 1: Geometridae

David Fischer

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Geometridae is a diverse family in Australia. Members of the family are numerous in habitats ranging from dry forest through rainforests of the tropical north. I've included examples of the habitats where I have photographed moths including many species of geometrids. Most of my trips have been to coastal forests (subtropical and tropical) of northern New South Wales and Queensland. I've also photographed moths in the escarpments of the Northern Territory and the Snowy Mountains of southern New South Wales.

In general, most Australia geometrids are cryptically patterned with colours that blend with bark or dry leaves. Some of the tropical species, though, are more brightly coloured. Forested areas always include a few small, green species. Most geometrids rest with outstretched wings but a few of the dry forest species hold their wings tent-like and resemble noctuids. Australia is home to several genera of day flying species. These are powerful flyers and I see these most often flying rapidly above the canopy in wet tropics of the north. The day flying species are often brightly coloured.

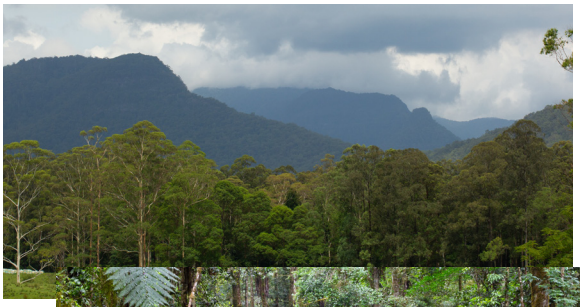
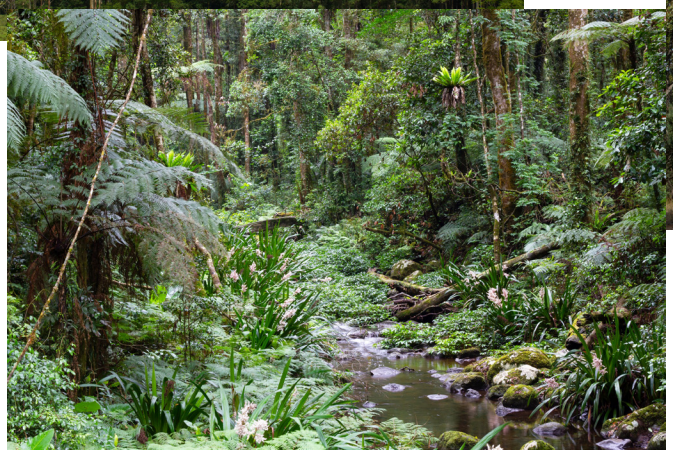
Ennominae and Geometrinae are the two big subfamilies of Geometridae in Australia. Oenochrominae is not as diverse but I think many more examples of this subfamily occur in Australia when compared to nearby Asia. This subfamily includes some of the largest and most spectacular moths found in Australia. A few of the brightly coloured Desmobathrinae also occur in Australia, especially in the tropical north. Most of the Larentiinae and Sterrhinae are small moths. They are common moths throughout the country.

Kakadu, Northern Territory -- left: panorama; right: details of escarpment habitat.

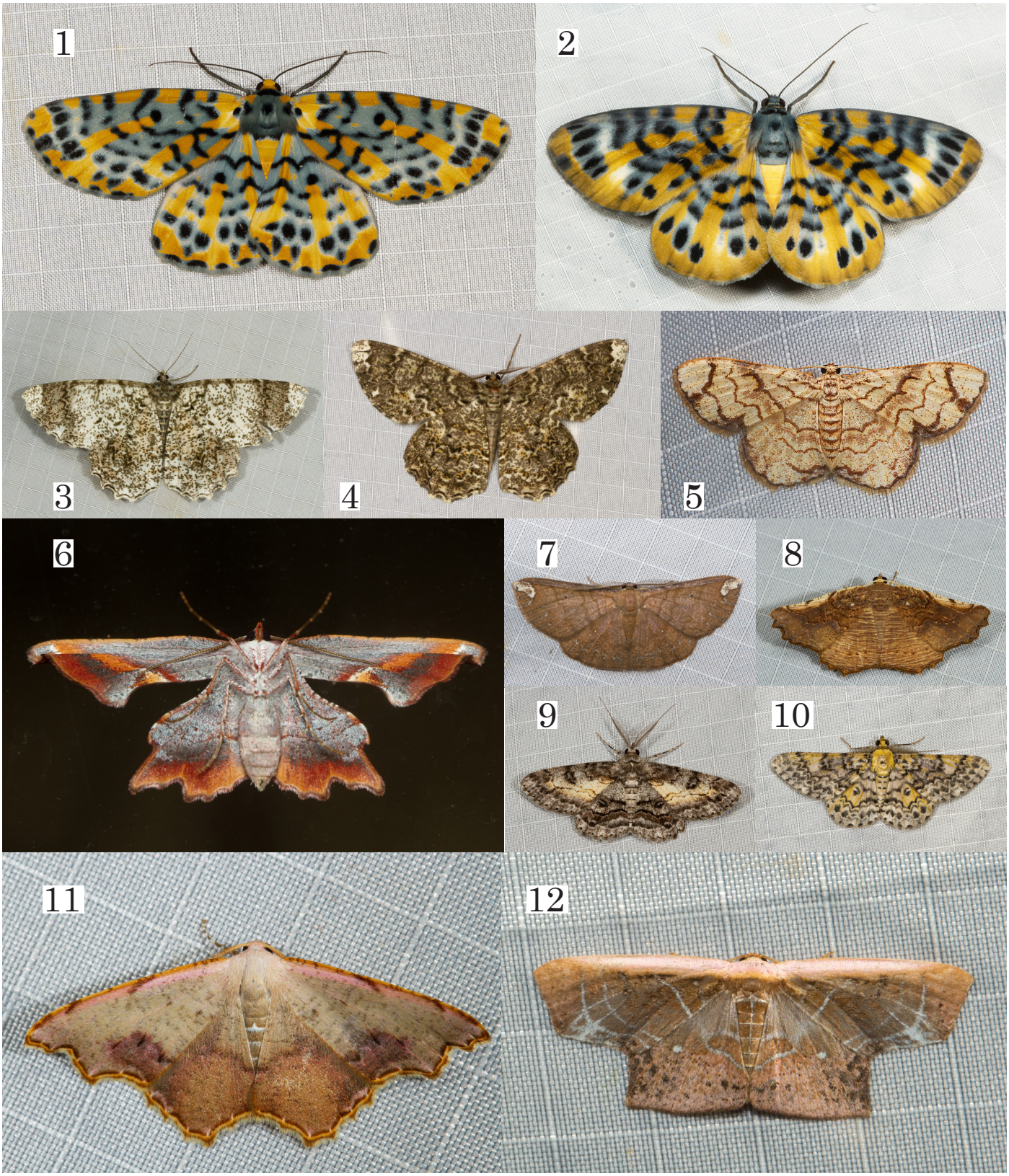
Left: Nitmiluk, Northern Territory; right: Blue Mountains, New South Wales


Left: Hinchinbrook Island, Queensland; right: Mission Beach, Queensland

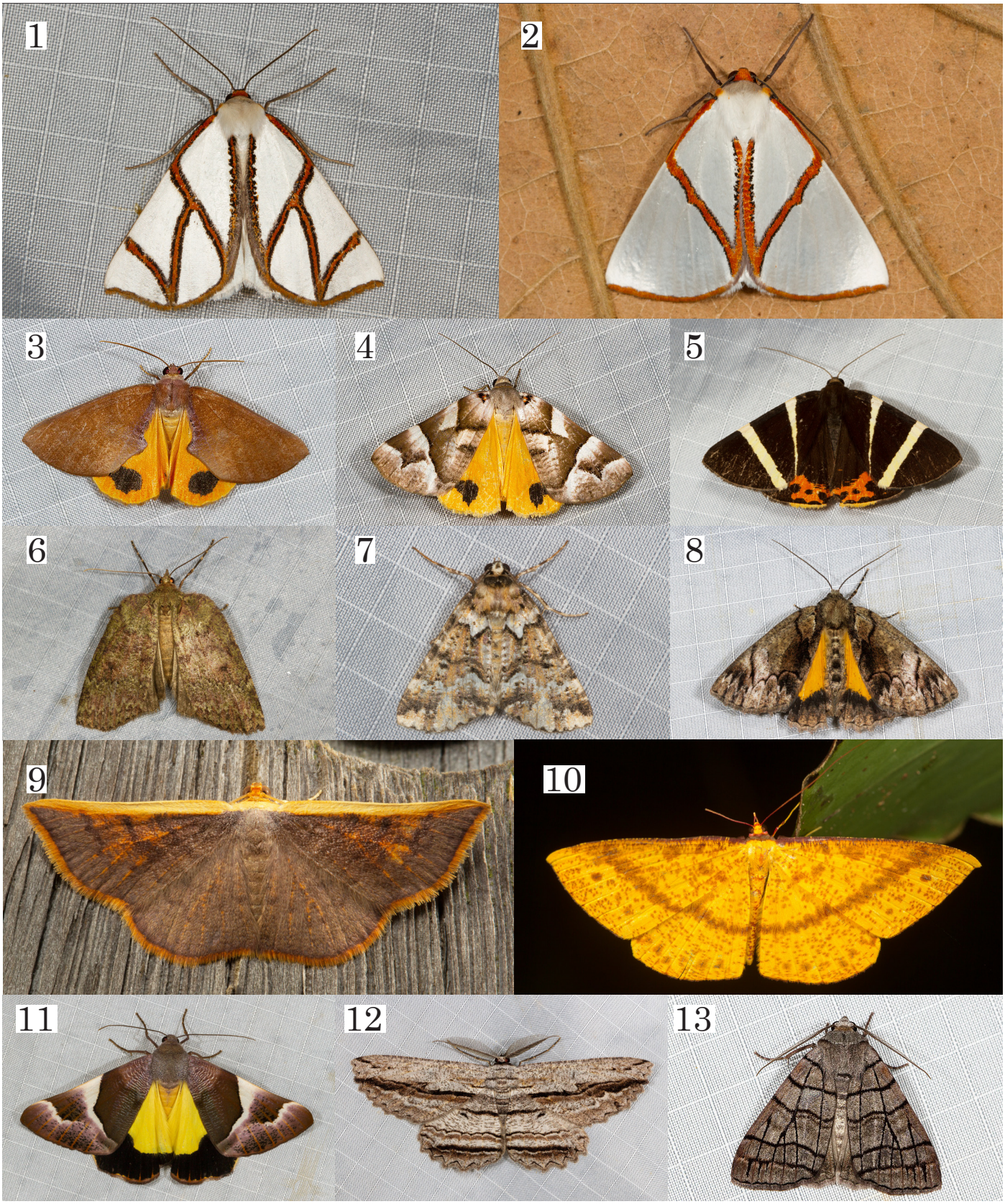

Left: Eungella, Queensland; right: Girraween, Queensland

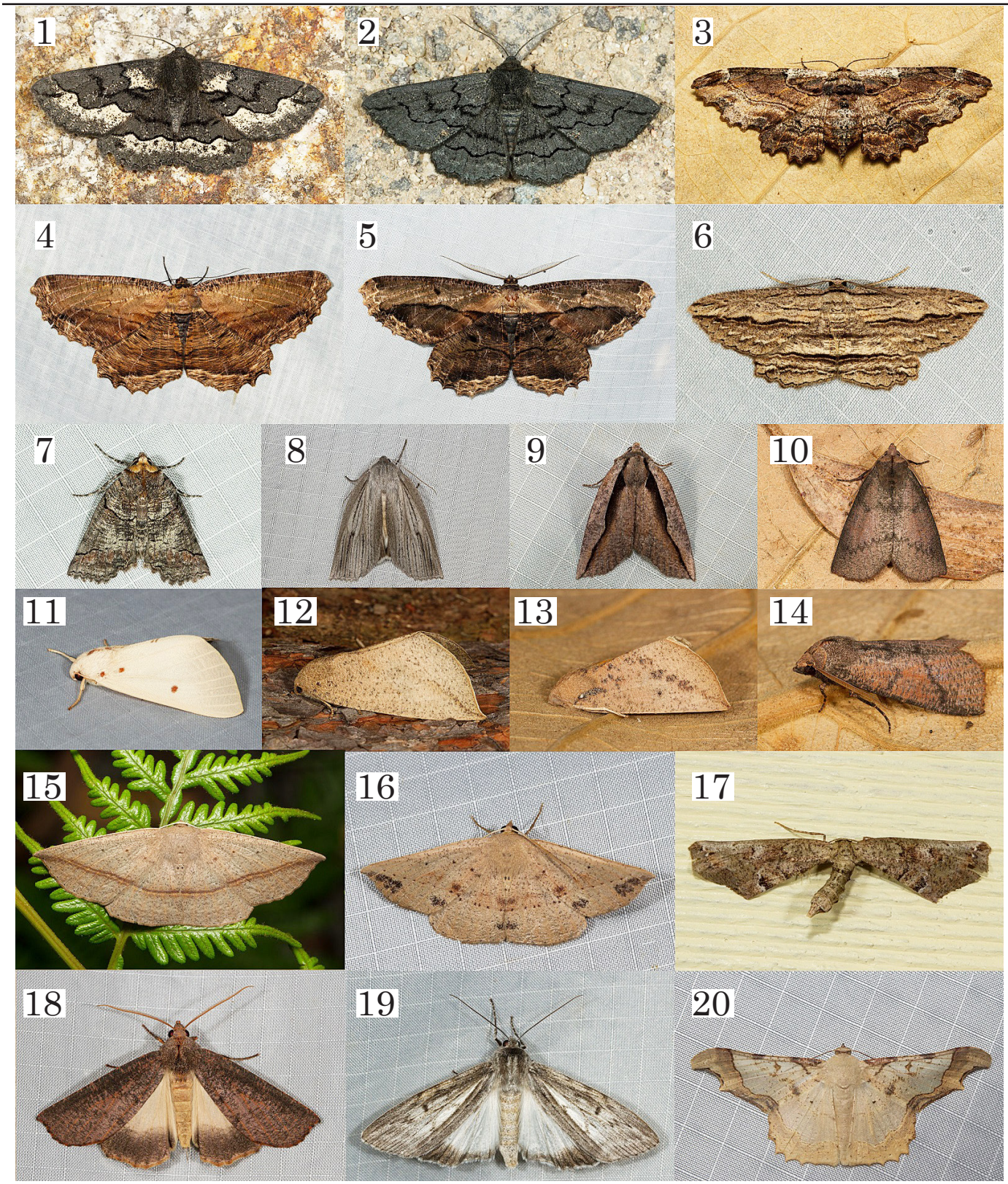

Left: Border Ranges, New South Wales;
right: Brigalow Scrub, Queensland



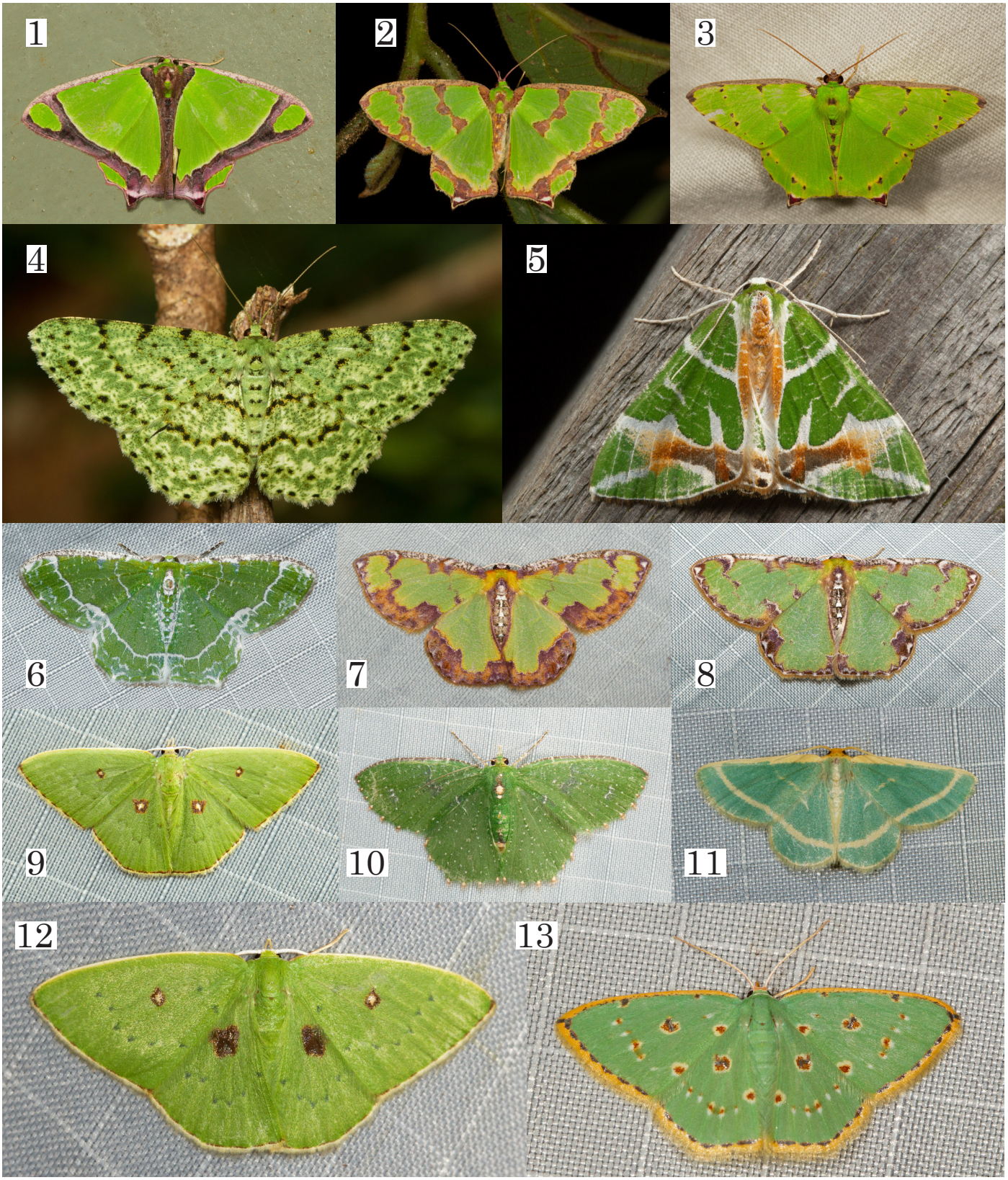
Geometridae, Plate 1: Ennominae. 1) *Bracca matutinata*, NightCap; 2) *Bracca rotundata*, Eungella; 3) *Amblychia subrubida*, Macquarie Pass; 4) *Amblychia subrubida*, NightCap; 5) *Heterostegane insulata*, Mission Beach; 6) *Proboloptera embolias*, Blue Mountains; 7) *Casbia albinotata*, Brisbane; 8) *Idiodes rhacodes*, Macquarie Pass; 9) *Cleora* sp., Canberra; 10) *Cleora* sp. possilbly *Cleora perfumosa,* Mission Beach; 11) *Epicompsa xanthocrossa*, Tallaganda; 12) *Tessarotis rubrata*, Macquarie Pass. Larger threads on the sheets are 5 mm apart.



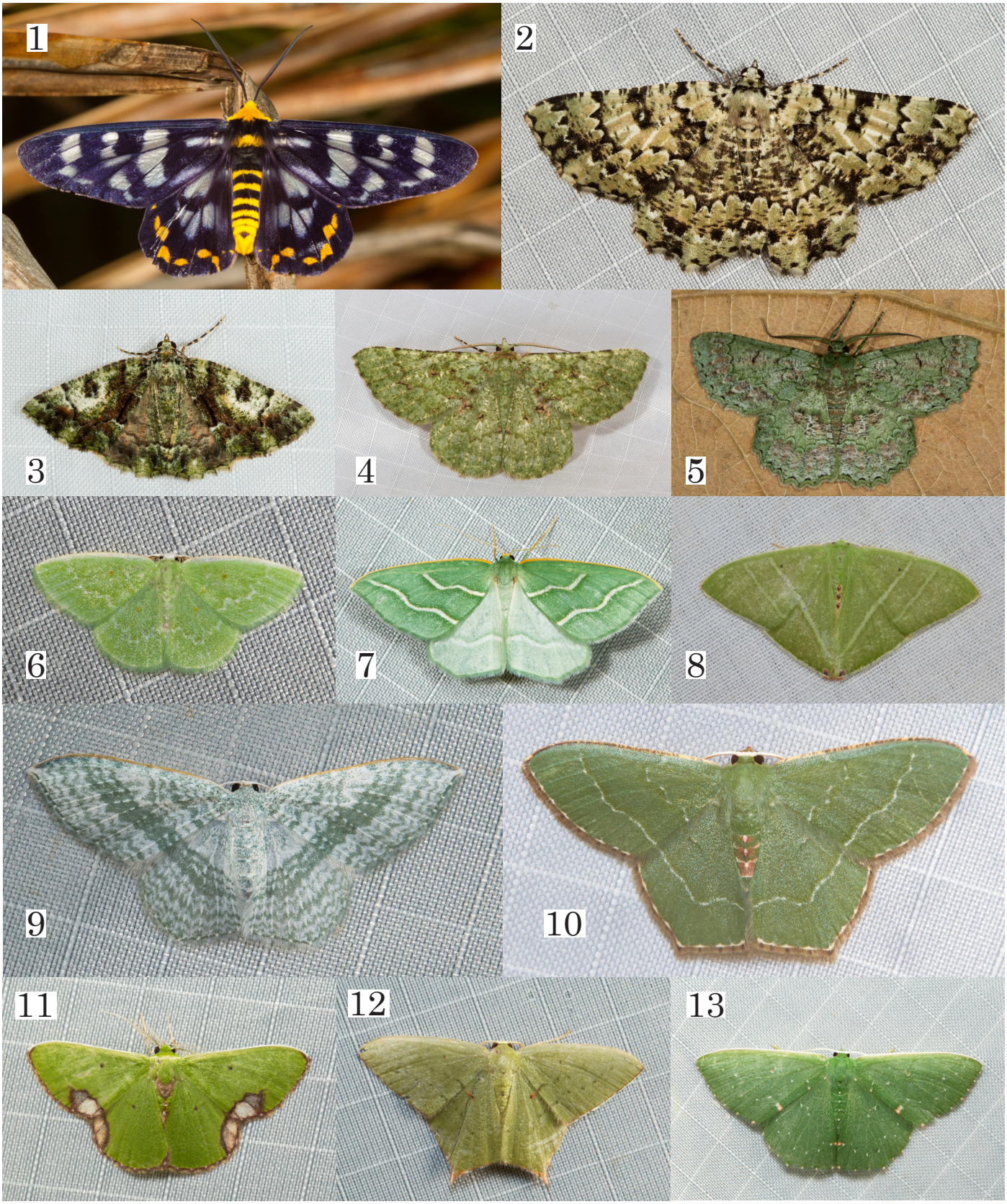
Geometridae, Plate 2: Ennominae. 1) *Thalaina clara*, Canberra; 2) *Thalaina selenaea*, Canberra; 3) *Larophylla amimeta*, NightCap; 4) *Lychnographa agaura*, Carrington Falls; 5) *Lychnographa heroica*, NightCap; 6) *Neoteristis paraphanes*, Mangerton; 7) *Lophosigna catasticta*, Brisbane; 8) *Heliomystis electrica*, Dharawal; 9) *Picromorpha pyrrhopa*, Barren Grounds; 10) *Eumelia rosalia* (Desmobathrinae), Mission Beach; 11) *Niceteria macrocosma*, Canberra; 12) *Scioglyptis* sp., Canberra; 13) *Liometopa rectilinea*, Carrington Falls.



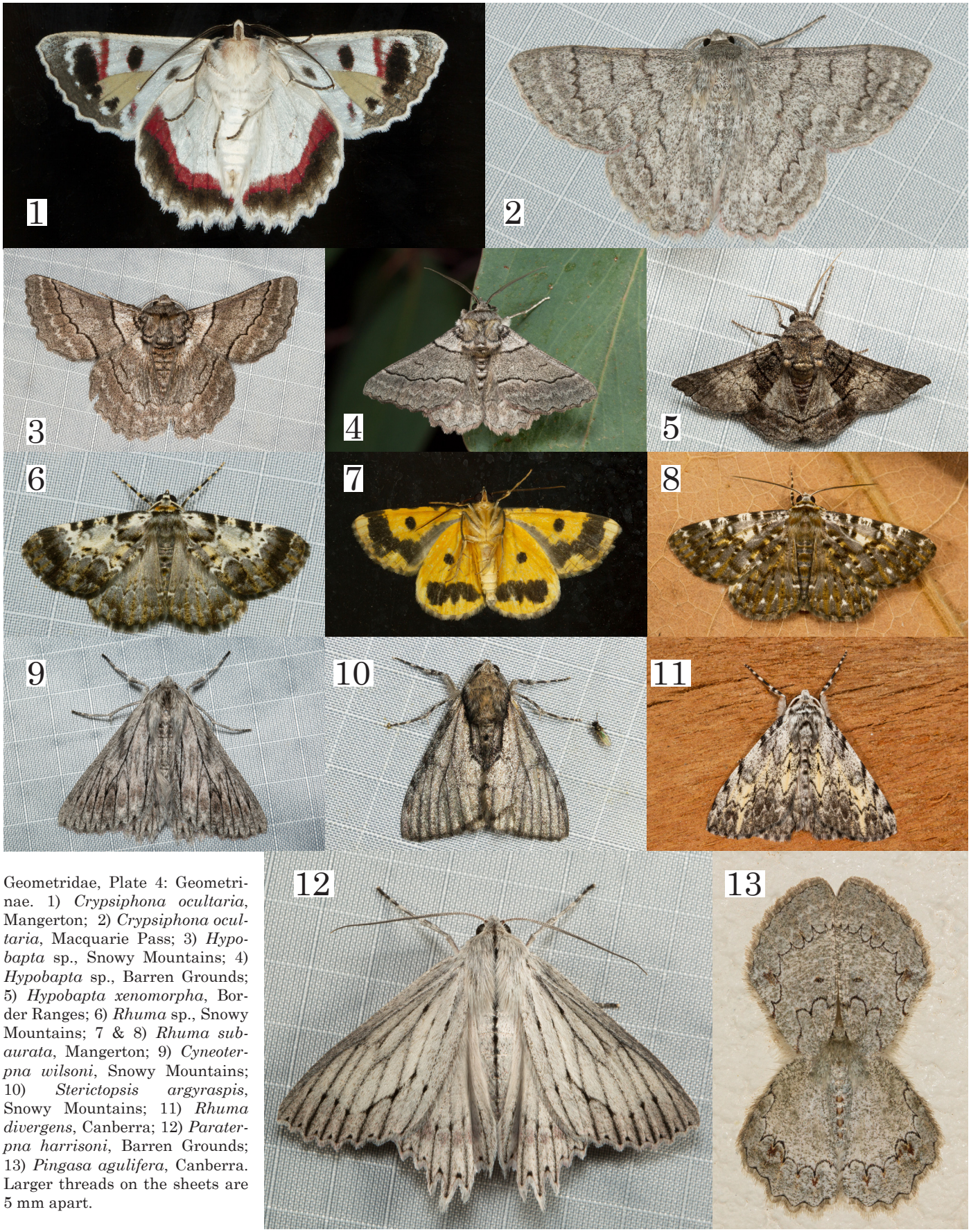
Geometridae, Plate 3: Ennominae. 1 & 2) *Melanodes anthracitaria*, Canberra; 3) *Pholodes sinistraria*, Mangerton; 4) *Chorodna* sp., Carrington Falls; 5) *Chorodna* sp., Border Ranges; 6) E*uphronarcha luxaria*, Dharawal; 7) *Nisista* sp., Canberra; 8) *Nisista* sp., Carrington Falls; 9) *Nisista* sp., Snowy Mountains; 10) *Fisera eribola*, Snowy Mountains; 11) *Plesanemma fucata*, Carrington Falls; 12) *Plesanemma* sp., Dharawal; 13) *Plesanemma* sp., Snowy Mountains; 14) *Fisera eribola*, Snowy Mountains; 15) *Idiodes siculoides*, Carrington Falls; 16) *Idiodes apicata*, Dharawal; 17) *Neogyne* sp., Mangerton; 18) *Paralaea* sp., Jamberoo; 19) *Capusa senilis*, Tallaganda; 20) *Zehaba spectabilis*, Mission Beach. Larger threads on the sheets are 5 mm apart.



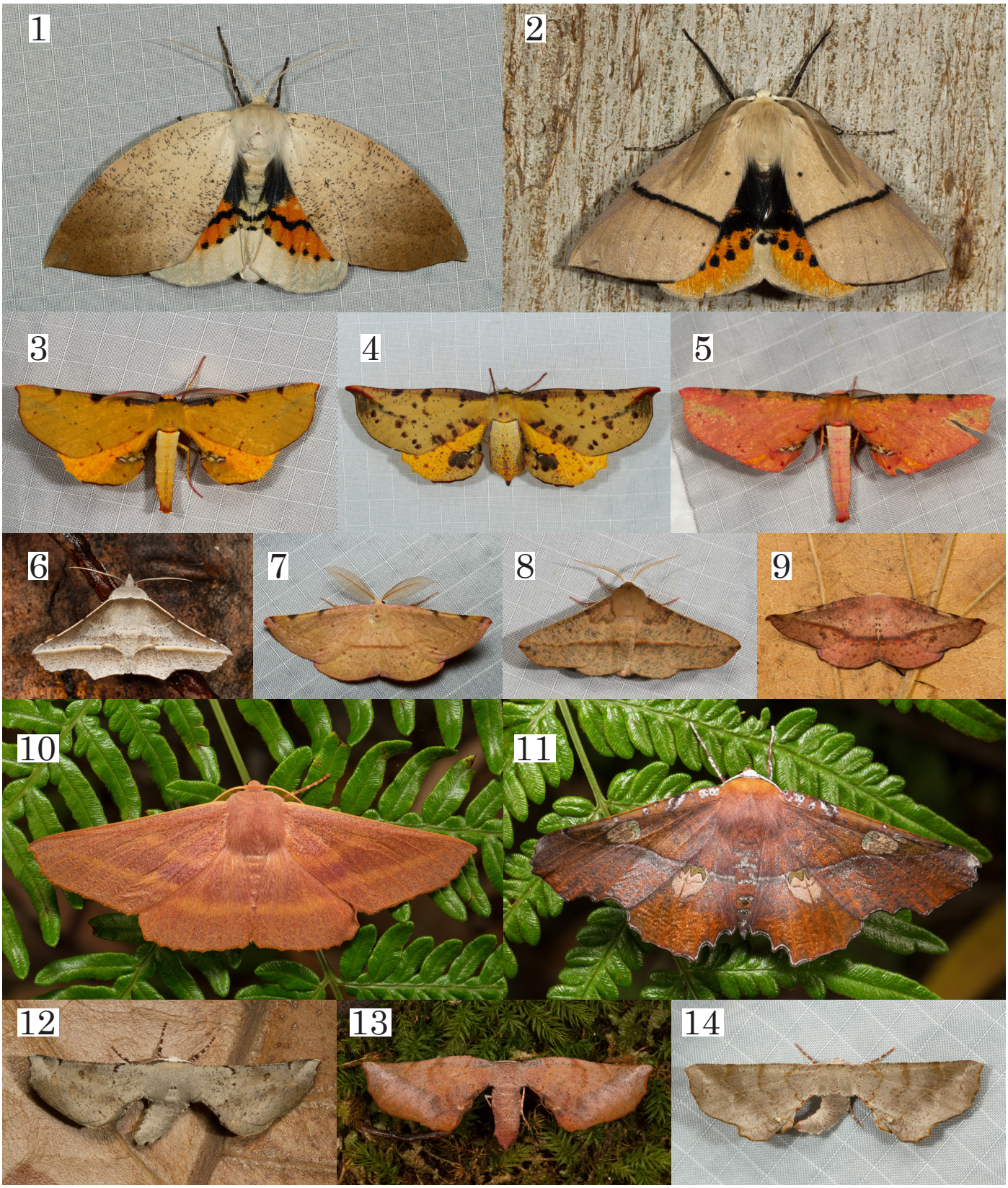
Geometridae, Plate 4: Geometrinae. 1) *Agathia prasinaspis*, Mission Beach; 2) *Agathia pisina* female, Mission Beach; 3) *Agathia distributa*, Mission Beach; 4) *Catoria delectaria* (Ennominae), Mission Beach; 5) *Chlorodes boisduvalaria*, Barren Grounds; 6) *Eucyclodes insperata*, Byron Bay; 7) *Eucyclodes buprestaria*, Mangerton; 8) *Eucyclodes buprestaria*, Carrington Falls; 9) *Comostola* sp., possibly *C. leucomerata*, Eungella; 10) *Eucyclodes metaspila*, *Eungella*; 11) *Mixocera latilineata*, Mission Beach; 12) *Comostola leucomerata*, Mangerton; 13) *Comostola laesaria*, Mission Beach. Larger threads on the sheets are 5 mm apart.



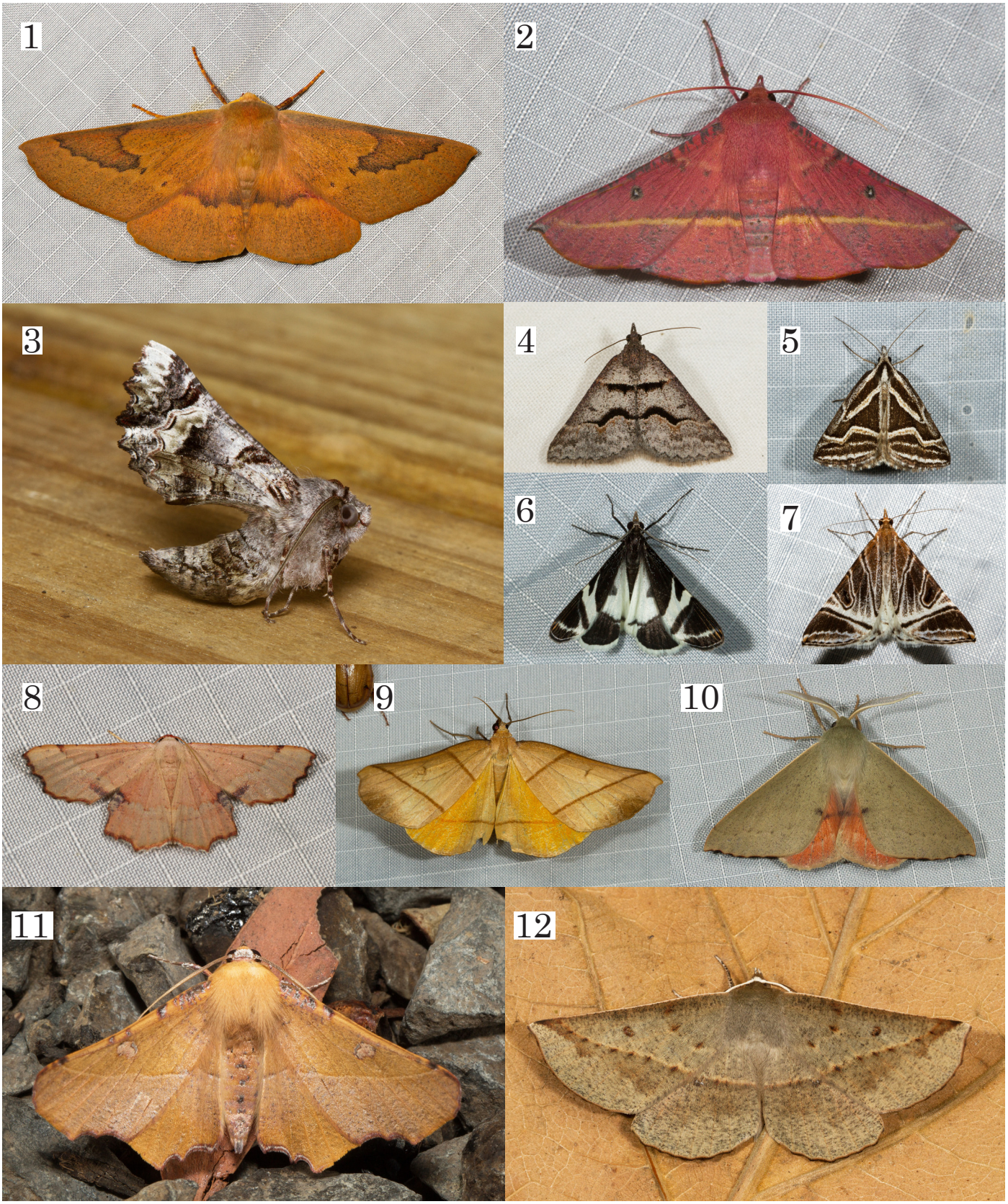
Geometridae, Plate 5: Geometrinae. 1) *Dysphania numana*, Mission Beach; 2) *Aeolochroma mniaria*, Girraween; 3) *Aeolochroma* sp., Canberra; 4) *Hypodoxa* sp., Brisbane; 5) *Hypodoxa bryophylla*, Wollongong; 6) *Cenochlora quieta*, Mangerton; 7) *Euloxia meandraria*, Canberra; 8) *Urolitha bipunctifera*, Mangerton; 9) *Eucyclodes pieroides*, Eungella; 10) *Hemithea* sp., Mission Beach; 11) *Comibaena connata*, Border Ranges; 12) *Cosmogonia decorata*, Eungella; 13) *Prasinocyma iosticta*, Border Ranges.



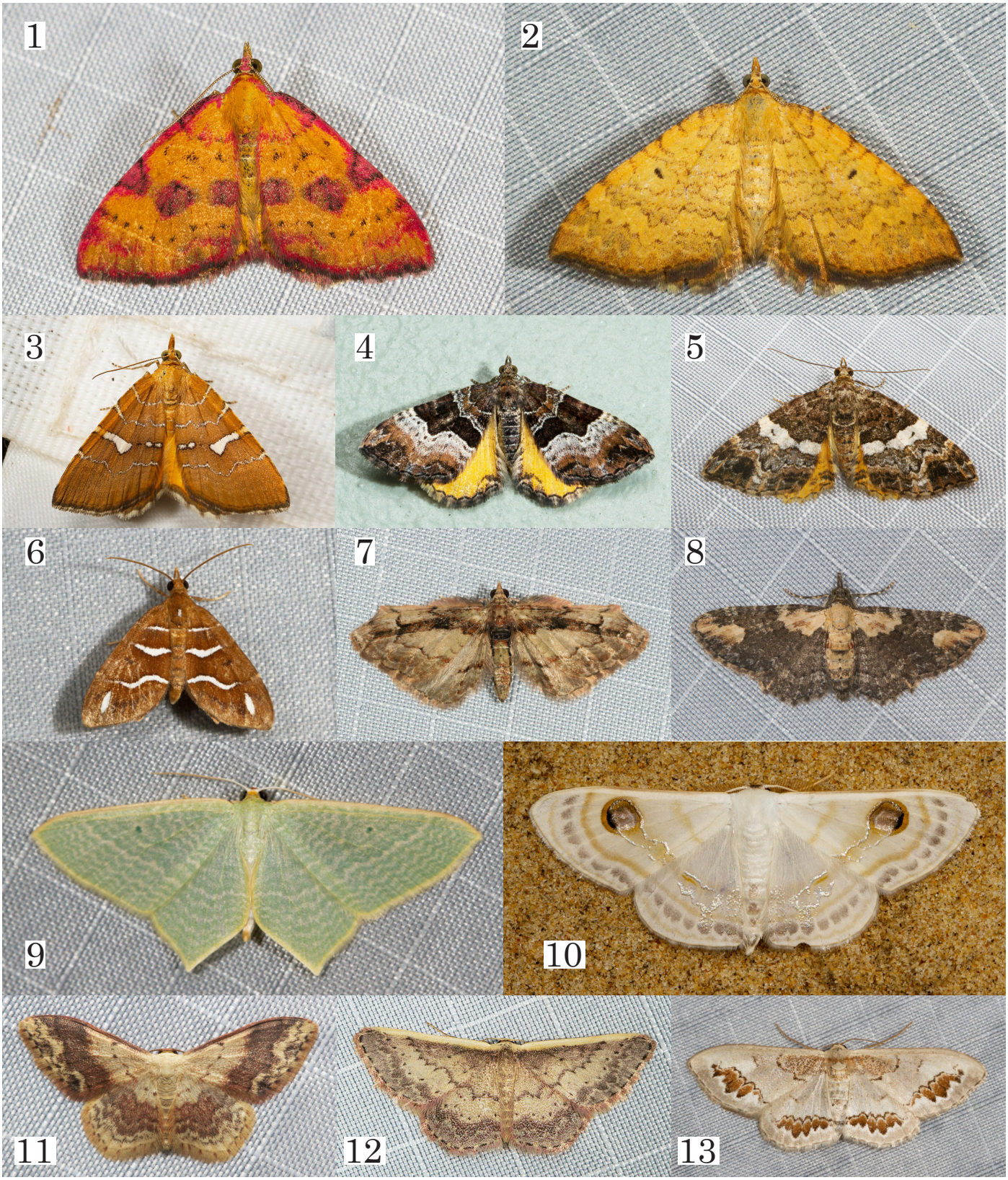
Geometridae, Plate 4: Geometrinae. 1) *Crypsiphona ocultaria*, Mangerton; 2) *Crypsiphona ocultaria*, Macquarie Pass; 3) *Hypobapta* sp., Snowy Mountains; 4) *Hypobapta* sp., Barren Grounds; 5) *Hypobapta xenomorpha*, Border Ranges; 6) *Rhuma* sp., Snowy Mountains; 7 & 8) *Rhuma subaurata*, Mangerton; 9) *Cyneoterpna wilsoni*, Snowy Mountains; 10) *Sterictopsis argyraspis*, Snowy Mountains; 11) *Rhuma divergens*, Canberra; 12) *Paraterpna harrisoni*, Barren Grounds; 13) *Pingasa agulifera*, Canberra. Larger threads on the sheets are 5 mm apart.



Geometridae, Plate 7: Oenochrominae. 1) *Gastrophora henricaria*, female, Dharawal; 2) *Gastrophora henricaria*, male, Tallaganda; 3) *Parepisparis lutosaria*, male, Dharawal; 4) *Parepisparis lutosaria*, female, Barren Grounds; 5) *Parepisparis lutosaria*, male, Jamberoo; 6) *Oenochroma vetustaria*, Snowy Mountains; 7) *Onycodes rubra*, Canberra; 8) *Antictenia punctunculus*, Canberra; 9) unknown, Snowy Mountains; 10) *Monoctenia smerintharia*, Border Ranges; 11) *Oenochroma quardrigramma*, Border Ranges; 12) *Circopetes obtusa*, Snowy Mountains; 13) *Parepisparis virgatus*, NightCap; 14) *Parepisparis excusata*, Mangerton.



Geometridae, Plate 8: Oenochrominae. 1) *Monoctenia falernaria*, Snowy Mountains; 2) *Oenochroma vinaria*, Mangerton; 3) *Hypographa* sp., Blue Mountains; 4) *Dichromodes atrosignata*, Canberra; 5) *Dichromodes confluaria*, Snowy Mountains; 6) *Phrataria bijugata*, Weddin Mountains; 7) *Phrataria transcissata*, Canberra; 8) *Cernia amyclaria*, Mary River; 9) *Systatica xanthastis*, Macquarie Pass; 10) *Arhodia* sp., Wollongong; 11) *Oenochroma quardrigramma*, Carrington Falls; 12) *Phallaria ophiusaria*, Canberra.



Geometridae, Plate 9: Larentiinae & Sterrhinae. 1) *Chrysolarentia perornata*, Snowy Mountains; 2) *Chrysolarentia correlata*, Tallaganda; 3) *Chrysolarentia leucozona*, Snowy Mountains; 4) *Chrysolarentia* sp. possibly *C. lucidulata*, Mangerton; 5) *Chrysolarentia phaedra*, Snowy Mountains; 6) *Chaetolopha niphosticha*, Mangerton; 7) *Chloroclystis filata*, Canberra; 8) *Chloroclystis testulata*, Mangerton; 9) *Poecilasthena* sp., Carrington Falls; 10) *Problepsis apollinaria*, Mission Beach; 11) *Idaea halmaea*, Mangerton; 12) *Idaea nephelota*, Tallaganda; 13) *Dithalama cosmospila*, Canberra. Larger threads on the sheets are 5 mm apart.

More on *Lepidotarphius perornatella* (Lepidoptera: Glyphipterigidae) in North America

Terry Harrison[1], Allen Lawrance[2], and Douglas Taron[2]

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Lepidotarphius perornatella (Walker) is the sole representative of its genus, which belongs to the moth family Glyphipterigidae. A complete account of *L. perornatella* was given by Heppner (2011), at which time the moth was known only from its native range in Asia. Subsequently, Austin et al. (2017) reported what was then considered to be the first observation of *L. perornatella* in North America, based on individuals collected in Marion County, Iowa USA in 2017. An account of the genital morphology and life history of the moth was given therein. The Iowa records from 2017 were predated by a photographically documented observation of *L. perornatella* in Lake County, Illinois USA in early July 2016, which was submitted to the website BugGuide (2016).

We here report the earliest North American record of *L. perornatella* known to date. On 7 June 2016, Douglas Taron observed and collected a mating pair of *L. perornatella*, one of which is shown in Fig. 1, along the shore of the North Pond in Lincoln Park, Chicago, Cook County, Illinois. The shoreline of this pond harbors *Acorus americanus* Raf. and *Carex* spp., as does the Iowa site in which the moths reported by Austin et al. 2017 were found. In late June 2016, the moths collected by Douglas Taron were sent to Terry Harrison, who identified them as *L. perornatella* on basis of the information in Heppner's (2011) paper.

This record is published here in the interest of providing additional insight into the history of introduction and expansion of this moth in North America. If the Illinois records from 2016 and the Iowa records from 2017 are part of the same introduction event, then it seems likely that the Chicago Illinois area was the moth's original point of entry into North America. The two specimens from the June 2016 collection are deposited in the insect collection of the Chicago Academy of Sciences, Chicago Illinois.

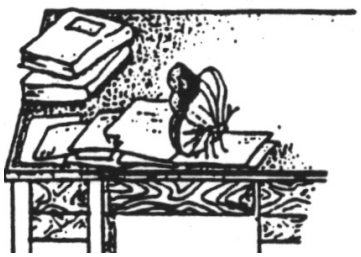
References

Austin, K., V. Nazari, J.-F. Landry, and S. R. Johnson. 2017. *Lepidotarphius perornatella* (Walker, 1864) (Lepidoptera: Glyphipterigidae) new to North America. News of the Lepidopterists' Society 59(4): 182–184.

BugGuide. 2016. *Lepidotarphius perornatella*. **https://bugguide.net/node/view/1499132**. Accessed 6 December 2018.

Heppner, J. B. 2011. Notes on the east Asian genus *Lepidotarphius* (Lepidoptera: Glyphipterigidae). Lepidoptera Novae 4(1): 27–31.

Figure 1. *Lepidotarphius perornatella*. One individual of a mating pair collected by Douglas Taron in Chicago, Cook County Illinois USA on 7 June 2016.

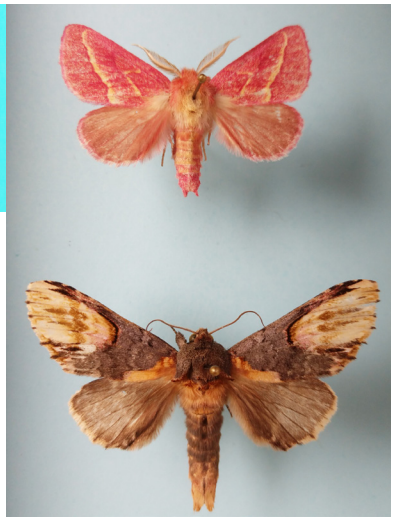


From the Editor's Desk

James K. Adams

Let me start by saying thanks to all the contributors. You continue to make my job pretty easy by filling the issues well ahead of the deadline (which, by the way, I STILL find myself reminding people that these dates are inside the back cover of every issue of the News). As always, let me know if you have any issues with what I'm doing.

The season has been a good one in Georgia. I am continuing to pursue sampling at the Fall Line Sandhills WMA in Taylor Co., GA (halfway between Macon and Columbus). A couple of the better species I've taken there are below.



Above: a state record in early August, *Metarranthis mollicularia*. Right: *Hyparpax aurora* (almost all pink) and another state record, from late May, *Schizura*, sp. nov., to be described in upcoming MONA (see Announcements, page 134).

Announcements:

The Southern Lepidopterists' Society invites you to join

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

Please write to me, Marc C. Minno, Membership Coordinator, at **marc.minno@gmail.com** if you have any questions. Dues may be sent to Jeffrey R. Slotten, Treasurer, 5421 NW 68th Lane, Gainesville, FL 32653.

Society of Kentucky Lepidopterists

The Society of Kentucky Lepidopterists is open to anyone with an interest in the Lepidoptera of the great state of Kentucky. Annual dues are $15.00 for the hard copy of the News; $12.00 for electronic copies. The annual meeting is held each year in November, at the University of Kentucky, Lexington. Jason Dombroskie will be this year's featured speaker. In addition, there will be a fall field meeting held in Georgia over the Labor Day weekend. Be looking for a report in the next SKL Newsletter. Follow the Society's facebook page (https://www.facebook.com/societykentuckylep/) for announcements of this and other field trips.

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, though that may change with the recent move to Spring for the SLS meeting in 2019, with whom we typically share a meeting. Dues are $95 per year for regular members in the USA ($80 for new members), and $50 for students. Regular memberships outside the USA are $125 yearly. See the troplep.org website for further information and a sample journal. Send dues to ATL Secretary-Treasurer, PO Box 141210, Gainesville, FL 32614-1210 USA. We hope you will join us in sharing studies on the fascinating world of tropical butterflies and moths.

The Wedge Entomological Research Foundation Revises Categories of Financial Support

In 1989 the Wedge Entomological Research Foundation (WERF) created the financial contributor category of Patron to recognize persons and organizations donating $2,000 in support of the Foundation's publication efforts, The Moths of North America series of monographs. Each Patron is recognized in every publication of the Foundation. Currently, there are eleven patrons.

The WERF is updating its categories of financial support. Until the year 2021, any person or organization desiring to become a Patron can pledge $2,000 to be paid in full or in three annual installments (to be paid in full by 31 December 2021). Beginning in January 2021 the Foundation will introduce new categories of financial support; Platinum = $10,000, Gold = $5,000, and Silver = $2,500. For all three levels of support, payments can be made in full or in three annual installments. Beginning in January 2021, the category of Patron will be closed, and all Patrons will be designated as Founding Patrons.

Founding Patrons, and contributors at the Platinum, Gold, or Silver level will be recognized in all future publications of the Wedge Entomological Research Foundation.

Please contact Kelly Richers, **krichers@wuesd.org**, for further information. Thank you for your continued support.

The Ron Leuschner Memorial Fund for Research

The 2020 cycle of the Ron Leuschner Memorial Fund for Research on the Lepidoptera is now open for applications. Each year, the Society will fund up to 2(+) grants for up to $500 each to undergraduate or graduate students depending on merit. Applicants must be members of the Lepidopterists' Society. Applications are due January 15 and must include submission of the application form (see the Lep Soc website at www.lepsoc.org), a brief (500 word maximum) proposal, and a letter of recommendation or support from the student's academic advisor or major professor. Submit all of the above to Shannon Murphy at **Shannon.M.Murphy@du.edu**. Snail mail applications should be sent to Shannon Murphy, Associate Prof., Boettcher West 302, Dept. of Biological Sciences, University of Denver, 2050 E. Iliff Avenue, Denver, Colorado 80208. Successful applicants will be notified by March 15. The review committee consists of members of the Lepidopterists' Society, including the previous year's successful candidates (who are thus not eligible for a new award in the subsequent year's competition). Award recipients will be expected to produce a short report for the committee at the conclusion of their year of funding, which summarizes the positive impact of the award on their research. Recipients must also acknowledge the Fund's support in any publications arising out of the funded work.

The 2017 Season Summary

The current status of the 2017 Season Summary is uncertain. We hope to be able to recoup the data and get it into a future summary, or at least into the database.

The 2018 Season Summary

The 2018 Season Summary WILL ship with the Winter 2019 issue of the News. So KNOW THAT IT IS COMING!! As such, PLEASE ALSO RESPOND to the request on this page for records for 2019. We hope for smooth sailing from here forward with the 2019 Season Summary and beyond.

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

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

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**

Corrections, Summer Issue of the News, 61(2)

In the opening article, "Unusual 2015 weather affects day-count field data", pgs. 59-67 by David Specht, I (the editor) made a few minor modifications, and in doing so uncharacteristically slipped in two errors: 1) on the bottom of Table 1, "countes" should read "counties"; 2) in the Acknowledgements, "thanks" (the 2nd word) should read "thank". I sincerely apologize to David.

In the second article on page 71 about U.S. specimens of *Eumaeus toxea,* Louis Handfield provided the following commentary: "In your paper on *Eumaeus toxea* in the News of the Lepidopterists' Society, you report that the specimens from Cameron County near Brownsville in southern Texas were collected 20-21 November, 1956. That is erroneous as Mr Filiatrault is using ROMAN LETTERS to state the month . . . To prevent problems [interpreting] labels, nearly all French Québécer [write] the month in Latin, as Mr Filatrault has done.

The label photographed is NOT meaning 20\1 11 56, but in reality it is 20 VII 56, so 20th of July 1956. The «V» is partly handwritten, so [this] is why this led you to interprete it as «\1», which is not the case. . ." Peter Hall thanks Louis Handfield, not only for the correction, but for bringing the important Filatrault collection to the Canadian National Collection.

Call for Season Summary Records

It seems odd for us to be asking you for Season Summary records when you haven't received one in a couple of years. Let us assure you one IS coming, and the coordinators sincerely apologize for the delay. Remember, the Chief Coordinators are now Brian Scholtens and Jeff Pippens.

The Season Summary database is on the Lepidopterists' Society home page (http://www.flmnh.ufl.edu/lepsoc/). The value of the online database increases as your data gets added each year. 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. They and their contact information, and the scope of their zone appears on the inside back cover of every issue of the "News".

Please have your data to the Zone Coordinator(s) no later than **December 31, 2019**. I know, you're still waiting for two years worth of records, but if you do it now you won't have to catch up later.

Most records are important. Reports of the same species from the same location provides a history. However, do not report repeated sightings of common species. Report migratory species, especially the direction of flight and an estimated number of individuals. Again, all of these records may be useful in the future. BE AWARE that some of these types of records will go IN THE DATABASE, but may NOT appear in the Season Summary.

Season Summary Spread Sheet and Spread Sheet Instructions

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

Photographs for Front and Back Covers

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

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

Announcements continued on pg. 134

Conservation Matters: Contributions from the Conservation Committee

Statewide butterfly monitoring by volunteer recorders in Ohio reveals a persitent decline in abundance, so what can we do?

Tyson Wepprich

Dept. of Botany and Plant Pathology, Oregon State Univ., Corvallis, OR 97331 **tyson.wepprich@oregonstate.edu**

Two years ago in Conservation Matters, Nick Haddad and David Wagner brought declines in common insects to our attention, spurred by a global review of animal population trends that showed a 35% decline in Lepidoptera abundance over 40 years among species with long-term data. Since then, worries about the health of insect populations have grown, following several new research articles with eye-popping numbers, such as a 75% decline in flying insect biomass in Germany. At a time when phrases like "insect apocalypse" and "ecological Armageddon" appeared in the popular press, we turned to the Ohio Lepidopterists to see how butterflies were faring.

Volunteer recorders in Ohio have quietly built the most extensive systematic insect monitoring dataset in North America. The quick disappearance of iconic butterfly species from Ohio, such as the Karner Blue (*Lycaeides melissa samuelis*) and the Regal Fritillary (*Speyeria idalia*), sparked Sonja Teraguchi and Mark Rzeszotarski at the Cleveland Museum of Natural History to start butterfly monitoring at one site in 1995 by following the Pollard walk methods of the exemplar UK Butterfly Monitoring Scheme. They and their colleagues foresaw the value of long-term butterfly data and hoped to document population trends before species were lost. Now, the Ohio Lepidopterists organize annual training workshops where volunteers can meet friends from the 70 other active monitoring sites, learn how to distinguish between the little brown skippers, or get instructions for setting up a new transect at a local school, park, or environmental education center. Volunteers have walked more than 25,000 weekly transects at sites around the state since 1996 (Figure 1).

With these butterfly surveys, my co-authors and I estimated statewide abundance trends for 81 species and for total abundance summed across all species. Our work was presented at this year's Lepidopterists' Society annual meeting in Davis, California, and recently published in *PLOS ONE* (**https://doi.org/10.1371/journal.pone.0216270**). After accounting for differences in sites and surveys, we estimate that on average total abundance has declined at rate of 2% per year, for a cumulative effect of 33% fewer butterflies seen in 2016 compared to 1996 (Figure 2).

Among the 81 butterfly species with sufficient records to infer population trends: 9 were increasing, 40 were stable or unclear, and 32 were declining. We looked at characteristics of the 81 species (like what they eat, whether they migrate, where they live, number of generations, and more) to see if certain kinds of butterflies were more likely to increase or decrease. This approach is one way we can try to understand the potential causes of these declines. We concluded that habitat loss, climate change, and pesticides were the three most likely contributors to insect declines, and these stressors will likely affect species differentially.

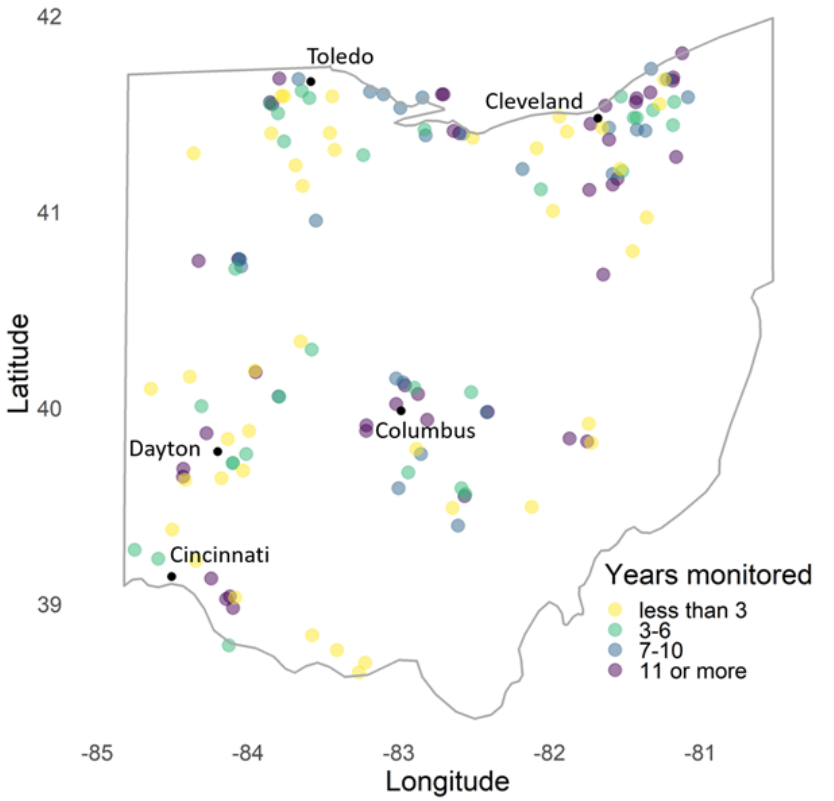


Figure 1: Locations of long-term butterfly monitoring sites colored by the number of years monitored in 1996-2016 that we used for our analysis of abundance trends. Source: **https://doi.org/10.1371/journal.pone.0216270**

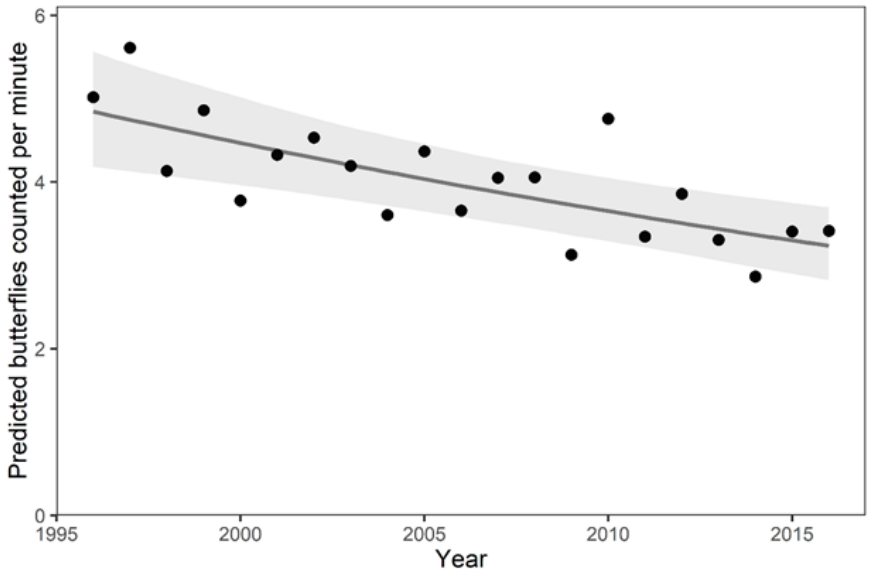


Figure 2: Butterfly abundance across all species together is declining at a rate of 2% per year for a cumulative decline of 33% over 20 years. Dots show annual variation in counts around the trend line, which has shading to show uncertainty in the estimated trend. Source: **https://doi.org/10.1371/journal.pone.0216270**

We compared the rate of change in Ohio to other published reports from long-term butterfly monitoring programs. The 2% per year rate of decline in total abundance is remarkably similar to those seen in the UK (-0.8% for widespread generalist species and -2.4% for specialist species), Netherlands (-2.0%), and Catalonia (-2.6%) when standardized on a similar scale. The proportion of species with significant declines compared to increases is also similar across the four countries. Moths in the UK's Rothamsted Insect Survey also have declined at a similar rate. The European butterfly programs, as well as Ohio's, monitor heavily modified landscapes with sites concentrated near where volunteer recorders live. There are a couple of recent examples of insect abundance increases in protected areas in cooler places where warming may make the climate more suitable for less cold-hardy insects.

There has not been rapid habitat loss in Ohio over the 20 years of the monitoring program. Around the state, habitat conversion from grasslands and forests to farms and cities had already happened. This may be one explanation for why we did not find that habitat specialists had steeper declines compared to the rest of the group, as one might expect. Habitat fragmentation between butterfly populations may be another force limiting abundance, but we did not find that larger butterflies, better at dispersal over long distances, had slower declines.

A warming climate favors some species over others and shifts the composition of a region's butterfly fauna. We found that butterflies adapted to cooler climates, with more northern geographic distributions and only one generation per year, had steeper declines than other Ohio butterflies on average. By contrast, the Gemmed Satyr (*Cyllopsis gemma*), a southern species, had the greatest increase in abundance in Ohio as its distribution expands into the state.

We might expect butterflies that can exploit human-modified habitat to be doing particularly well in a state with half of its land area dedicated to crops and pastures. However, we were surprised that common species like Cabbage White (*Pieris rapae*), Orange Sulphur (*Colias eurytheme*), European Skipper (*Thymelicus lineola*), and American Copper (*Lycaena phlaeas*) have steeper declines than the overall rate of 2% per year. Some of these species can be agricultural pests and may be among the intended targets of insecticide use. Our worry is that the widespread use of pesticide applications, common to many modern farming operations, is unintentionally having a negative spillover effect on the broader butterfly community.

We believe that our work represents how butterflies are faring in Ohio, but with some caveats. Volunteer-selected monitoring sites and their butterfly populations may not be representative of the state as a whole, being on average more forested and urban than the agricultural land-use that comprises half of Ohio. A recent study by Fournier and colleagues in *Conservation Biology* examined a potential bias in monitoring programs when sites are selected in places with above average abundance for the species of interest, as these would be more likely to decline due to regression to the mean. Fortunately, in the UK they have sent recorders to monitor sites in more agricultural areas by randomized design and found that trends at the volunteer-selected and randomly selected sites are similar. A rerun of our analysis with the first year at each site removed shows no change in our estimated total abundance trend.

You may have noticed in Figure 2 that I label our graph with "predicted counts per minute". Why not estimate the actual number of butterflies? Insect abundance is difficult to estimate, even with extensive datasets! It's not as simple as adding up every weekly count, as counts fluctuate not only with the population's abundance that interests us, but also with seasonal phenology, habitat at the site, observer experience, flowers blooming near the transect, and weather. We did the best we

The Cabbage White, *Pieris rapae*, is in apparent decline in Ohio

could to standardize counts across weeks, sites, and years by including differences between sites, observer effort, and minutes per survey in our models of statewide butterfly abundance and interpolating missing surveys based on the species' local phenology. We based our predictions on a statistical model of the trend of butterfly abundance over years at an average site with an average observer. Our results can be judged by the amount of data available for each species and the uncertainty in the estimated trends **(https://doi.org/10.1371/journal.pone.0216270.t002)**, as many butterflies have localized populations that are not reliably observed.

Many of the rarest species, in peril of extirpation, do not have enough data from the statewide monitoring program to assess their long-term trends. Species of conservation concern often require more targeted monitoring of difficult to reach habitats, e.g., wetland taxa may require specialized and difficult efforts to acquire accurate estimates of their populations. It is ironic that one of the original monitoring goals of tracking threatened species nearing extinction remains elusive even with a legion of volunteers and extensive data. However, efforts to track common species across the state has provided a more urgent warning about declines in ecosystem health that affect the butterfly community and insects more generally.

Is a steady 2% per year decline an insect apocalypse? When the slow decline persists over decades, the cumulative losses approach worrying magnitudes. We do not know if this is a global problem, because we mostly have widespread, systematic monitoring in Europe and North America for Lepidoptera. These are not necessarily representative of the diversity of regions, insect taxa, biomes and protected areas globally. However, when we look at the best datasets about insects we find a similar rate of decline over the last few decades in places dominated by human land-use.

What can we do? I agree with a recent article by Forister, Pelton, and Black **(https://onlinelibrary.wiley.com/doi/10.1111/csp2.80)** that calls for action even if there is uncertainty in our current knowledge of the extent and causes of insect declines. They outline management policies at different scales, ranging across governments, farmlands, natural areas, and backyards, to encourage native insect diversity by restoring habitat, reducing the harm of pesticides on nontarget insects, and taking action to slow anthropogenic climate change. As an individual, you can have the greatest impact through advocating for these changes in land management from local decision-makers who control larger areas. You can also convert grass lawns to native plants, even in an area as small as 6x6 feet, to provide nectar and host plant resources for butterflies and moths and reduce the amount of fertilizer, pesticides, and water required for maintenance. The "kill your lawn" movement is growing and recently was featured with a how-to guide in the July/August 2019 issue of *Popular Mechanics* magazine.

Any person enthusiastic about Lepidoptera can contribute to our knowledge of their abundance, distribution, and conservation status by monitoring at different levels of commitment. Many regions have established monitoring programs for moths (**www.discoverlife.org/moth**) or butterflies (**www.thebutterflynetwork.org**). The value of these programs will become apparent well before 20 years of counts accumulate. Sharing data across these many programs should help us gauge how widespread Ohio's findings generalize in North America and whether species show the same trends in places with a wider range of habitat, climate, and land management.

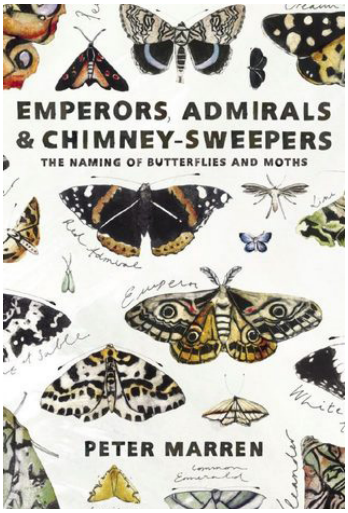
Without a systematic monitoring program nearby, you can also contribute counts to eButterfly (**www.e-butterfly.org**), an online checklist tool with regional expert verification that is building a database of observations across North America. Checklists, where all species are recorded on a field trip, provide some structure to observations that can still give scientists a way to measure if abundance is changing. For example, Breed and colleagues found that butterflies' geographic distributions were associated with whether they grew more or less abundant using lists of species recorded by the Massachusetts Butterfly Club on field trips around the state.

For my level of commitment and frankly limited ability as a naturalist, I use the iNaturalist smartphone app to record any insect slow enough for me to photograph. Butterflies and Moths of North America provides another photograph-based website to submit observations **(www.butterfliesandmoths.org)**. My hope is to progress to checklists when my identification skills improve. Mary Ellen Hannibel, author of the book *Citizen Scientist* and attendee of our annual meeting, writes that iNaturalist provides a way to share knowledge and passion for nature between novices and experts in an online community that encourages greater outreach to people from a broader range of backgrounds. The growing source of observations is in great need for Lepidoptera recorders to help others learn what is in their backyard through crowd-sourced species identification and verification of records.

I am excited at the possibilities to combine our records of moth and butterfly distributions and abundance through all the data available—collections, systematic monitoring, checklists, and opportunistic observations. I think we will have a better sense of how insect communities have changed beyond the most recent couple of decades and beyond the few taxa for which we have systematic monitoring. Although there are many challenges in combining these alternative sources of data, I am optimistic that we can continue to monitor butterflies more accurately with more eyes while inspiring more people to consider Lepidoptera conservation in their daily actions and political advocacy.

Book Review

Emperors, Admirals and Chimney Sweepers by Peter Marren. 2019. A Little Toller book. 263 pp., copiously illustrated. U.K. price 30 pounds sterling. ISBN 978-1-908213-71-6, hardcover only.



There is no end of jokes based on conflating "entomology" with "etymology". Most Lepidopterists have at one time or another wondered where both the "common" and scientific names of butterflies and moths come from. Although I grew up in America, one of the first Lep books I got as a kid was the Frederick Warne "Larger Moths" guide for the U.K. So I learned a bunch of odd Britishisms very early—things like "Oak Eggar"; what in God's name was an "Eggar?" One that caused me endless tribulation was the "Lead Belle." Was it the foremost among the beauties at the ball, or merely of a dull plumbeous color? Later I got at least fragments of a classical education, such that I could navigate the Greek and Latin of scientific names with a modicum of ease. In 1991 A. Maitland Emmet published the invaluable but surprisingly little-known *The Scientific Names of the British Lepidoptera: Their History and Meaning*. A few years ago I was invited by a publisher to write a book to be called *Latin for Lepidopterists*. We negotiated the terms of the project. Meanwhile I investigated what it would entail in terms of time and effort and I realized I could only do it by taking a leave from my regular University duties, and it fell through. I had entered into the correspondence feeling overconfident as to my abilities. My confidence foundered over the name *zerene* (either the *Speyeria* species or the coliadine genus); try as I might I could not tell a decent story about it. It was then that I realized how much digging such a book might require. I still have no story for *zerene*.

This veddy, veddy British book, by the well-known natural-history writer Peter Marren (*Rainbow Dust,* a great favorite of mine which I have reviewed on Amazon.com), covers both the common and the scientific names of much of the British Lep fauna (in the process incorporating some names of interest here across the pond). The first part of the book is a history of the naming of British Leps. Much of this will be familiar to those who read *The Aurelian Legacy* by Michael A. Salmon (2000), but there is a little new material, as well as lists of names used by the earliest authors—James Petiver (1717), Eleazar Albin (1720), and Benjamin Wilkes (1742-49). Many of the old names are exceedingly quaint. As everyone knows, Chaucer is nearly unintelligible to modern readers, Shakespeare includes much that must be explained or translated, and even the librettos of Gilbert and Sullivan, just over a century old, contain terms and allusions completely opaque to today's reader (what, for example, are "Parliamentary trains?"). Marren is good at exposing the meanings of the antique English names. He throws in a few Continental ones, too.

The second part of the book is less successful. The problem is organization. Philatelists (stamp collectors) and collectors of postcards, advertising (trade cards) and other paper stuff often specialize "topically." They may collect stamps with pictures of musicians or insects, or advertisements for farm implements or sewing machines or soap. The organizational possibilities are endless. Marren tries to group common names into topical affinity groups, but the categories are often not intuitive and appear arbitrary. There is a huge amount of information presented, but I found myself obliged to read through the second part from front to back to get it all, since the book didn't really "work" as an encyclopedic reference. If one has specific names in mind, be they common or scientific, one can of course use the index. Annoyingly, Marren often does not give the scientific name to go with the common name. A good example is the Mother Shipton moth (p.224), named for a fanciful profile of a legendary hag's face in the forewing pattern. Its genus is named for the geometer Euclid. It is one of two moth genera named for him; the other one (*Euclida*) is treated in this book (on pp. 213 and 226) but Mother Shipton's *Euclidia* –of which we have North American species—is not. No scientific name is given anywhere in the book for Mother Shipton's namesake. And I am gratified that there are quite a few names that Marren is at a loss to explain—*Bena, Tyta, Daraba*, for example. Some inexplicable names look like they should be easy, e.g. *Archanara.* Good luck! These are to Marren as *zerene* is to me.

Marren does not find any British Lep names that must be spoken to be understood. One entomologist famously named a series of non-Lep genera with girls' names followed by the nonsense suffix *chisme,* e.g. *Susichisme* ("Suzy, kiss me!"). Another insect is named *Lalapa lusa.* Our own John Burns gave a skipper the specific epithet *nuspesez,* which appears meaningless until spoken (when it comes out "new species"). Are we ready for a Marrenesque book covering our American fauna? If I ever retire and no one has done it yet…

Arthur M. Shapiro, *Ctr. for Pop. Biology, Univ. of California, Davis, Davis, CA 95616.* **amshapiro@ucdavis.edu**

Literature Cited

Emmet, A.Maitland. 1991. The Scientific names of the British Lepidoptera: Their History and Meaning. Harley Books, Colchester, U.K.

Salmon, Michael A. 2000. The Aurelian Legacy: British Butterflies and Their Collectors. Harley Books, Colchester, U.K.

The Marketplace

IMPORTANT NOTICE to ADVERTISERS: If the number following your ad is "613" then you must renew your ad before the next issue if you wish to keep it in the Marketplace!

Equipment

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

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

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

Drawers: Leptraps now offers Cornell/California Academy storage drawers. Drawers are made of Douglas Fir, hardboard bottom and glass top. Finished in clear satin gloss varnish. A single card holder with pull or two card holder with a knob pull. Foam pinning bottom is available.

Price does not include shipping. If purchasing 20+ drawers, and you live within 350 miles from Georgetown, KY, I will meet you half way for delivery. Mastercard/Visa, Pay Pal, checks accepted.

For more information visit: **www.leptraps.com**, or contact Leroy C. Koehn, Leptraps LLC, 126 Greenbriar Drive, Aurora, OH 44202; Tel: 502-542-7091, e-mail: **leptraps@aol.com**. indefinite

(Speaking of Leptraps) **FOR SALE**: LEPTRAPS LLC

After 32 years of designing, fabricating and marketing globally, I would like sell Leptraps LLC and retire. I would like to collect Lepidoptera and travel.

The business includes all the drawings, inventory, and some equipment. I operated the company from my home.

To successfully manage Leptraps LLC you must have knowledge of Insects, especially Lepidoptera. You must have design skills, knowledge of Sheet Metal and machining, plastics and electronics (12VDC & 120VAC & 220/208 VAC). Leptraps LLC is a well known global company. Leptraps LLC has sold product into Canada, South America, Australia, South Pacific, Asia, Europe and every state in the United States. Leptraps LLC has also sold product into Greenland, Iceland and many countries that are poorly known.

The price is $150,000 USD. Or, make me a reasonable offer.

Leroy C. Koehn, Leptraps LLC, 126 Greenbriar Drive, Aurora, OH 44202; Tel: 502-542-7091, e-mail: **leptraps@aol.com** indefinite

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

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

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

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

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

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

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

Publications

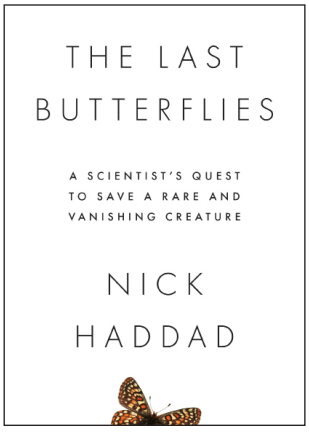
Ctenuchina de Guyane française, Lepidoptera, Erebidae, Arctiinae, Arctiini (partie 1)

by Jean-Aimé Cerda. In French and English.

$90.00 softcover. 2017. 181 p., 20 full-page color plates with 149 photos of adult moths & 1 map of collecting zones; 115 figs. in text (photos of male genitalia). [Memoir No. 7, Société Linnéenne de Lyon] Treats 119 species currently known from French Guiana: 43 species added & 15 species removed from the fauna of French Guiana. Describes 2 new genera & 18 new species; 16 new combinations, 10 species with revised status, 11 new synonyms. Companion volume (Euchromiini de Guyane Française, 2008, softcover with 2 CDs of photos of adults & male genitalia) also available for $105.95. Entomological Reprint Specialists, 2985 E. Manzanita Ridge Pl., Tucson, AZ 85718-7342. Free U.S. shipping if you order direct (bugbooks@aol.com), or order online (no free shipping) at https://tinyurl.com/yaeeoy84 or on Amazon.com. 613

The Last Butterflies: A Scientist's Quest to Save a Rare and Vanishing Creature

by Nick Haddad



Most of us have heard of such popular butterflies as the Monarch or Painted Lady. But what about the Fender's Blue? Or the St. Francis' Satyr? Because of their extreme rarity, these butterflies are not well-known, yet they are remarkable species with important lessons to teach us. *The Last Butterflies* spotlights the rarest of these creatures—some numbering no more than what can be held in one hand. Drawing from his own first-hand experiences, Nick Haddad explores the challenges of tracking these vanishing butterflies, why they are disappearing, and why they are worth saving. He also provides startling insights into the effects of human activity and environmental change on the planet's biodiversity. A moving account of extinction, recovery, and hope, *The Last Butterflies* demonstrates the great value of these beautiful insects to science, conservation, and people. 613

Seeking OOP Books: If you or someone you know has copies no longer being referenced, or you know of a source for **The Butterflies of Colorado, Part 1** (Satyriinae) and/or **Part 2** (Heliconiinae and Danainae) and/or **Part 3** (Nymphalinae), by Michael S. Fisher (C. P. Gillette Museum series), please contact Parker Backstrom at **dpbackstrom@embarqmail.com.** 613

Research

To all it may concern: Search Notice.

We are searching for a very mysterious moth species : *Aphomia fuscolimbellus* Ragonot (Lepidoptera, Pyralidae) (see fig 1). It was described in 1887 by Ragonot under the name of *Melissoblaptes fuscolimbellus*, and the type locality given was «Amér. sep.». On the label of the type it is «Am. spt.» for «Amérique septentrionale» or «America septentrionalis». There is only one specimen known, actually in the Muséum National d'Histoire Naturelle, in Paris (France). The type is a male and it has a wingspan of 24mm. It was sent by Moeschler to Ragonot. We know that most of the specimens described by Moeschler from North America were coming from Labrador through the Moravian Missionaries. Was it the case with this specimen?

Nobody knows. The abdomen of the specimen seems to have been cut off. Was it for genitalic dissection purpose? In any case, no dissection was found in the Muséum in Paris (Patrice Leraut, pers. comm.).

According to Dr Alma Solis (pers. comm.), it could be a misslabeled specimen seemingly related to an Indo-Australian group of moths. But who knows? If North American, it could feed on dried materials, insects, etc., and it could be a late Autumn or an early Spring species.

SO, if anybody has one or more specimens in collection that could be this species, from America or other countries, please contact urgently: **Louis Handfield, 845 de Fontainebleau, Mont-Saint-Hilaire, Québec, Canada J3H 4j2; e-mail: lscal@netrover.com;** and **phone**: **450-467-8925** indefinite

Fig. 1 Type of Aphomia fuscolimbellus Rag. (image courtesy of Jean-François Landry).

Research, continued

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). indefinite

Equipment/Books looking for a home

Books and Equipment: Home wanted

I am in need of downsizing my lepidoptera cabinets/ Cornell drawers as well as some books as my wife and I are looking at smaller homes. I don't want to simply "toss" any of this material that has been so special over the years, but I think many of us collectors will be going through this as we age! Here is what I have right now: 1). Complete set of Moths of Am N of Mexico fascicles; 2). Claude Lemaire's 3 vol set on Saturniidae; 3). An excellent 1000 watt Vernon Brou light trap/moth attractor in case with bulb ready to shine; 4) Also one or two 12 drawer Cornell cabinets with emptied drawers. There would be minimal charges to anyone who could provide a good home, though shipping would clearly be more difficult for the equipment than the books. If interested, contact Steve Mix at **citheroniaregalis@hotmail.com.** 613

Announcements

Continued from p. 127

Karl Jordan Medal Award to Marianne Horak

Marianne Horak received her Diploma in Entomology at the Entomology Department, Eidgenössische Technische Hochschule (ETH) Zuerich, Switzerland, in 1950. She received her Ph.D. in 1983. She was a Scientific Assistant on a research grant at ETH, Zuerich, 1977–1982. CSIRO Entomology: 1983–1985, Visiting Research Fellow; 1986–1988, Postdoctoral Award; 1988–1998, Research Scientist to Senior Research Scientist, and 1998–2010 Principal Research Scientist (responsible for the Lepidoptera Collections). Dr. Horak received a medal and a monetary prize from ETH for her Ph.D. thesis in 1983, and a Prix Pro Systematica Entomologica award from the Swiss Entomological Society in 1984. Currently Dr. Horak serves as the Honorary Fellow, CSIRO Ecosystems Sciences.

Dr. Horak has been recognized as the premier author on the Tortricidae, but she has also made major contributions to studies of Pyraloidea and Cossoidea. Her early systematic papers included summaries of the family Tortricidae in *Tortricid Pests, their Biology, Natural Enemies and Control* (1991) and also in the *Handbook of Zoology* as co-author of the Cossoid/Sesioid Assemblage and the sole author of the Tortricoidea (Kristensen, 1998). The latter represented the most thorough syntheses of classification and morphology based on the evaluation of characters and classification in nearly 75 years. This volume also examined relationships based on the discovery of novel characters and pheromone components (chemical attractants). She also contributed markedly to *Checklist of the Lepidoptera of Australia* and the *World Catalogue of Insects,* especially on the Tortricidae. She is also interested in endemic Australian groups of global taxonomic significance such as *Ogmograptis*, which led to a revisionary study and reassessment of the family Bucculatricidae (Horak et al. 2012). In her retirement, Dr. Horak continues to work on the Australian National Collection (ANIC) and publish new contributions to the study of lepidopterology. She also serves as the Editor and Chief of the Monographs on Australian Lepidoptera.

Undoubtedly the crowning achievement of Marianne's career is her extraordinary monograph on the Olethreutine Moths of Australia published in 2006, which is truly the culmination of a long and productive career as a tortricid taxonomist. The 522 page opus received the highest praise of her colleagues and she received the inaugural J. O. Westwood Medal from the Royal Entomological Society and the Natural History Museum, London, in 2008. It is for her original research in this volume and major publications on systematics, biology, phylogenetics, natural history, and biogeography of the Tortricidae that the 2019 Committee recognizes Dr. Marianne Horak with the Karl Jordan Medal.

New MONA Fascicles coming!

The Wedge Entomological Foundation is dedicated to producing volumes in the series "The Moths of North America (MONA)". 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 Wedge is pleased to announce that there are two more "in the pipeline" of the MONA series at this time. The first notodontid fascicle is already out. The Acronictinae volume is next, and following that is the second volume of the Notodontidae. Thus 2019 and 2020 volumes are in the process of production at the present time.

Membership Updates

Chris Grinter

Includes ALL CHANGES received by August 21, 2019. Direct corrections and additions to Chris Grinter, **cgrinter@gmail.com.**

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

Blaise Barney: 1025 Alison Circle, Livermore, CA 94550 (blaise@maui.net)
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James P. Fitter: 12804 Madeley Ct., Fairfax, VA 22033 (james.fitter@gmail.com)
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Michael M. Ellsbury: 70855 Highway 8, Fairbury, NE 68352 *new cell number* (402 805-5456)
Alvin F. Ludtke: c/o Chuck Norris, Blythe Ave., Orangevale, CA 85662 (aludtke@gmail.com)
Hugh McGuinness: 4510 48th Street NW, Washington, DC 20016 (hdmcguinness@gmail.com)
Norris J. Pangemanan: Jl. Arnold Mononutu no. 100 Dusun V, Kawiley Kec. Kauditan, Manado, Sulawesi Utara 95372, INDONESIA (tempur@hotmail.com)

upperside

underside

After an intense "freak" hailstorm that deposited up to 2" of slush in Sacramento, California on Feb. 26, 2018, this Mourning Cloak (*Nymphalis antiopa*) was found battered but barely alive. A sad way to end a successful overwintering!

Arthur M. Shapiro, Center for Population Biology, U.C. Davis, Davis, CA 95616 **amshapiro@ucdavis.edu**

Hailman, constructed after an intense "freak" hailstorm that deposited up to 2" of slush in Sacramento, California on Feb. 26, 2018.

A treasure hunt for mistakes in DnB, the database of nymphalids of Brazil

L. T. Shirai*, L. L. Mota, and A. V. L. Freitas

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ABSTRACT

We recently published DnB, a database that centralizes all published Nymphalidae species lists in Brazil, publicly available at https://doi.org/10.5281/zenodo.2561408. DnB is an up-to-date and curated database, carefully compiled to accurately represent each of the 357 studies we catalogued. We prepared DnB to allow the easiest and quickest possible access to a wide range of relevant information by students, amateur, and professional lepidopterists and their diverse purposes. The current version of DnB has 341 columns of locations and 1,591 rows of specific epithets; plus 34 columns of additional information for each study, totaling more than 558k cells of information. No matter how careful we strived to be, we must have made mistakes during the cataloguing process, and for DnB to achieve its full purpose, it must be error-proof. We thus announce here a treasure hunt for mistakes in this database, to be sent to 2018dnb@gmail.com until December 2019. An illustrated book of Brazilian Lepidoptera will be given as the prize for the three people who find most errors, according to the rules laid down in this article.

Keywords: Nymphalidae, inventory, species list, databank, Neotropical

At an age of menace for global biodiversity, people who intend to protect life must be at least as organized as those who destroy it. However, a disadvantage exclusive of those on the preserving side is that one needs to understand biodiversity to protect it. Scientific knowledge takes time to be produced, but it can benefit from other sources of information. Parsing the content from the diverse array of media available today requires technical training, and accurately organizing the data for quick and easy access is a watchmaker process. Here though, one advantage of the preserving community is that the usual good will of its members actively helps the making or the improvement of initiatives necessary to counter-act destructive measures.

This article has the purpose of asking this community to help improve a database of species distributions of a group of highly diverse, charismatic, bioindicator, and flagship insects – the Nymphalidae butterflies – in a tropical, continental, and at-risk country – Brazil (Shirai et al. 2019). We ask for your contribution because the database of such a well-studied and rich group, in a region that holds a good portion of its diversity, involves data at the scale of hundreds of thousands of entries. No matter how careful we were, errors might have passed our eyes, and finding them is a treasure hunt in a vast sea of information (Fig. 1). The treasure itself is an error-proof database, but we will offer as winning prizes three copies of a book illustrating the Brazilian Lepidoptera (de Almeida & Freitas 2012, reviewed by Willmott 2012).

DnB, the Database of nymphalids in Brazil (Shirai et al. 2019, translated version to Portuguese available at http://doi.org/10.5281/zenodo.2561417), centralizes the state of the art of all Nymphalidae species lists ever reported in this country. We catalogued 341 species lists from 357 studies (peer-reviewed or not), gathered from a throughout search in physical and virtual repositories (such as libraries) and media (such as online reports). DnB, publicly available at https://doi.org/10.5281/zenodo.2561408, has three worksheets: DnB (species occurrences), Additional Information (AI sheet), and Tutorials.

The DnB sheet contains the occurrence data (X for presence and 0 for absence) for 1,591 specific epithets (rows) at 341 locations (columns, under 329 DnB #s – DnB #s, or DnB numbers, correspond to studies, and are used to navigate from one sheet to another). In this sheet, additional columns may help you filter a group within Nymphalidae (subfamilies according to Wahlberg et al. 2009) or by its taxonomic status (validity according to Lamas 2004). It also lists misspellings by the studies, and cases when a specific epithet appeared in another genus, catalogued in DnB in the valid one (according to Lamas 2004) – with these arrangements, each specific epithet appears only once in DnB, in its correct orthography ("Taxon" column). We did consider as a species entry those cases with only the genus specified (e.g. *Euptychia* sp.) but did not consider as a species entry cases of unidentified taxonomic ranks other than genus (e.g. Satyrinae sp., Nymphalidae sp.) – likewise, we did not include the latter case in the count of richness, or number of species. Here, the main sources of errors may be at the: 1) presence/absence data of each study; 2) classification of specific epithets into valid species, valid subspecies, or invalid; 3) placement of a specific epithet published in a former genus in the currently valid one; and 4) misspelled names by a given study.

The AI sheet has 34 columns of additional information for each DnB # (see Table 1 of Shirai et al. 2019, that describes the content of this sheet). A DnB # corresponds to a single study published in one or multiple parts (e.g. one part for each nymphalid subfamily; in this case, the DnB # will appear repeated). If the same study was published

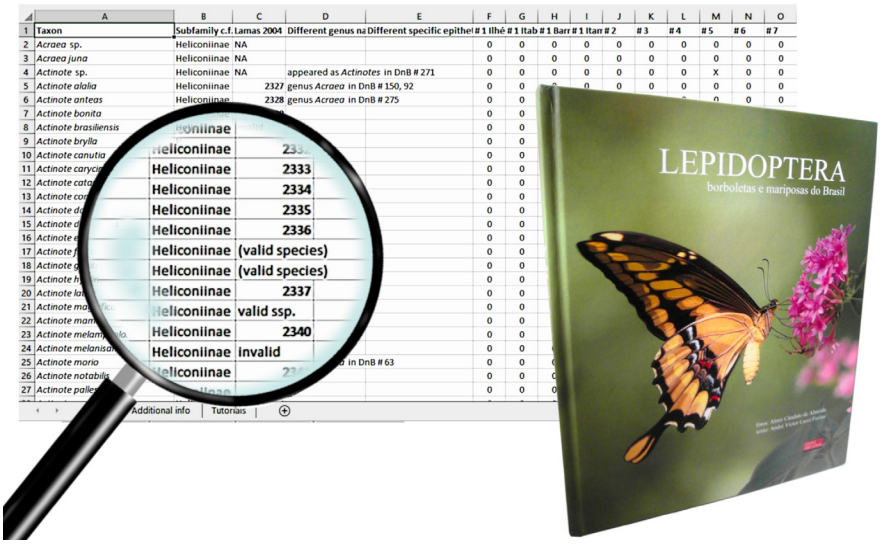

Figure 1: This treasure hunt will give 3 books of amazing photographs of Brazilian Lepidoptera for those who find most errors in DnB.

in multiple different media, like a thesis and an article, we only catalogued the most complete version (and the other is listed under DnB #: NA). When a DnB # row is followed by empty cells below it, it means this study sampled in different localities – coordinates for each locality are given in different rows, and information of remaining columns appear, when appropriate, with "as above" to avoid repetition. Here, the main sources of errors may be at the columns: 1) Urban?, 2) Regional or local?, 3) Coordinate source, 4) Altitude, 5) Sampling period, 6) Sampling effort, 7) Method, and 8) # traps. A highly unlikely source of error, but if present of profound impact, is the DnB # itself, that is, that the species list catalogued in DnB sheet under a certain # does not correspond to the # in AI sheet.

When we catalogued the additional information of these 329 DnB #s, we noticed that some studies did not report basic information to understand both how the species list was made and the credibility of the data, for example, how long was the sampling period? How were the species identified? Where can we find the specimens to confirm or update species identification? Guided by the thought of applying the data from these species lists to several purposes, and to assess their comparability, some of the columns in the AI sheet quantified the amount of missing information in the studies (Table 1 in Shirai et al. 2019). We prepared a checklist of the minimum information required by any study that involves a species list (Fig. 3, op. cit.). Thus, we estimated or inferred the information of several columns or cells in the AI sheet, according to the study itself or to specialized literature (e.g. priority areas according to MMA 2007); which may imply that sometimes the datum was given by the study but we missed it, or we inferred data wrongly. We could as well have missed an important source of information (i.e., a new AI column) that is relevant to allow comparability and standardization among studies and should be part of the checklist. Any corrections in our estimations and any suggestions or discussions to the checklist are more than welcome, but only the former count as an error.

Finally, the Tutorials sheet has step-by-step procedures of how one can use DnB for different questions. As this sheet is just an example of how the database can be used, and there must be better ways to achieve the same goals, we do accept suggestions to make the tutorials clearer or easier but will not consider them as errors – unless it is a real mistake, such as a wrong excel command, in the way we proposed the tutorial.

THE RULES OF THE GAME

The terrain for this treasure hunt is the database (https://doi.org/10.5281/zenodo.2561408), primarily in the DnB and AI sheets. We would like to correct any kind of error in any cell of this Excel file, but an error is defined here as a mismatch in the cataloguing process of the content of a study to DnB, not in the study's content itself. We made DnB not to correct the data provided by studies we catalogued (such as the species identification, taxonomic status, or spelling of a taxon name), but to represent the original content as faithfully as possible. Having said that, mistakes detected by consulting the original study (e.g. wrong or missing content such as, the study wrote "*Neruda aoede*" and we catalogued as if the study wrote "*Neruda aeoede*," but not the fact that *aoede* is part of *Heliconius* now) will have double the weight than those detected by only consulting DnB (e.g. a typo by us, not by the study). If you published, or are aware of (and own the pdf or printed version of), a list with more than 5 nymphalid species in Brazil or a locality within 20km of the Brazilian border, in any of the media we considered (article, book/book chapter, dissertation/thesis/monography, congress/conference paper, online report), published before December 2017, and we did not catalogue it, it will be counted proportionally to the species number, with weight 1 per 10 species. To better understand what a mistake can be and where most likely they will be found in DnB, please see explanations and description of the database above, and also consult Shirai et al. (2019) for how we prepared DnB. We will not consider the way we made DnB as a source of error, for example, the fact that we decided that "Nymphalidae sp." should not count as a species.

The errors should be sent to 2018dnb@gmail.com until 31st December 2019, with the subject "treasure hunt." We ask you to tell us your full name and where you are from (at least the country) and write, for each and every error found in DnB: 1) the worksheet, 2) the DnB #, 3) the row (if in DnB sheet) or the column (if in AI sheet), 4) the mistake, and 5) if you consulted or not the original study. A single e-mail per person will be accepted; if we receive multiple e-mails by the same person, only the last one will be looked at.

If you do not have an e-mail or access to a computer, please send your list of mistakes to the address given in the affiliation but be sure it will arrive before the due date.

We will analyze each mistake sent to us and reply to the contributor only if there are disputes. We will allow ourselves not to respond if you did not understand the rules of this game (for example, if you are correcting a study, not the database), and we may judge that by looking at the first 10% of listed mistakes, so rank your mistakes from the most to the least likely ones. Prizes (Fig. 1) will be given to the three people who find most errors, and we will announce who they are by e-mailing all contributors with the rank and total points per contributor – we will mass e-mail using a blank carbon copy (bcc); if you wish to stay anonymous in this mass e-mail, tell us a nickname we should use to refer to you (but do not forget to tell us where you are from). A private message will be sent to the winners asking for postal information.

Lastly, the easiest way to find mistakes is by using DnB. If you or anyone you know can make use of the database, for example to know the richest places for nymphalids in Brazil, or to quickly access the distribution of a taxon in the literature, or to be aware of what was done in your region, tell this person about the treasure hunt so you can help biodiversity research in Brazil, and maybe win a beautiful book about our favorite insects!

Acknowledgements

We would like to thank Patrícia A. Machado, Augusto H. B. Rosa, Mariana A. Stanton, Jessie P. dos Santos, and Lucas A. Kaminski for improving the manuscript; and Almir C. de Almeida for donating us the books that will be awarded in this treasure hunt, and for allowing us to use the book cover in our figure. LTS acknowledges the Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP 2014/23504-7), and LLM thanks Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brazil (CAPES) – Finance Code 001 for fellowships. AVLF acknowledges support from FAPESP (Biota-Fapesp grants 2011/50225-3, 2012/50260-6, and 2013/50297-0), from the Brazilian Research Council – CNPq (fellowship 303834/2015-3), Rede-Lep-SISBIOTA-Brasil/CNPq (563332/2010-7), from the National Science Foundation (DEB-1256742) and from USAID / U.S. National Academy of Sciences (NAS), under the PEER program (Sponsor Grant Award Number: AID-OAA-A-11-00012).

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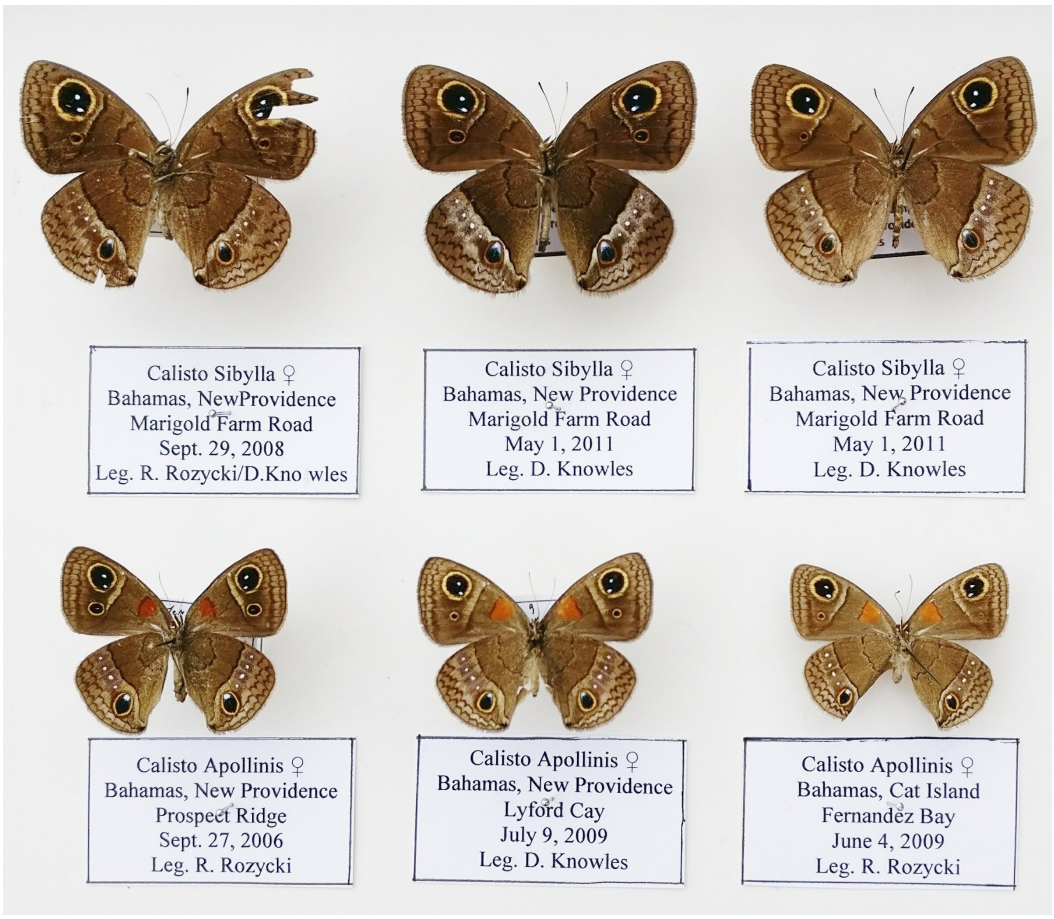

Callisto specimens with supplementary eyespots: Top, C. sibylla; bottom, C. appolinis. Photo by Patricia Rozycki. (see next page)

Supplementary eyespots in *Calisto* from the Bahamas

Rick Rozycki[1] and Denis Knowles[2]

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[2]Nassau, New Providence, Bahamas

ABSTRACT: There are two species of *Calisto* known from the Bahamas: *Calisto sibylla* and Calisto *apollinis*, which is a distinct species. *Calisto sibylla* is very local and scarce in occurrence, while *Calisto apollinis* is fairly widespread and common. Both species are now known to occur with supplementary eyespots and are illustrated here.

There are approximately 44 species in the genus *Calisto* (Rayner, Nunez, Aguila 2013), which is a wholly West Indian genus.

Calisto biocellatus was described as a valid species from two specimens taken on Pico Cuba in the Sierra Maestra, by de la Torre in 1968. It has a small ocellus on the underside of the forewing in space 2. Riley (1975) considered it a good species or possibly another race of *C. sibylla*. Alayo and Hernandez thought of it as a form of C. *sibylla delos* with no notable difference in the genitalia. The authors consider it no more than a form of *C. sibylla* with supplementary eyespots. We have collected both species of *Calisto* occurring in the Bahamas with the same variation.

No other known species of *Calisto* normally has any spot in space 2 of the forewing on the underside. Examination of long series of various other *Calisto* species will probably show supplementary eyespots are not as rare as previously thought. There is a specimen of *Calisto batesi* illustrated on the cover in Tropical Lepidoptera Vol.7, No. 1, Part 2. It has a supplementary eyespot on underside in space 2.

C. sibylla (D.M. Bates 1934) is known in the Bahamas from New Providence and both North and South Andros. It is a rare and localized species there, and is usually found in thinly grassed, rocky coastal limestone areas that are adjacent to pine forest. It is recorded from South Andros at Yeho Pineyard by Clench; and Mark Simon collected a specimen in March 2014 south of Mars Bay Settlement. On North Andros it is recorded from Red Bays by Harvey and Peacock (1989).

On New Providence the authors have seen or collected it from two widely separated locations. The first one is at the southeast end of the island near Yamacraw, and its habitat there is as described above. The second area is in the north central part of the island, near Gladstone Road. This area was recently cleared and developed for a new hotel and recreational area. It is also the same area where a colony of *Dianesia carteri* was originally found. Fifty-five specimens of *C. sybilla* were examined and we found three with supplementary eyespots in varying degrees.

C. apollinis D.M. Bates occurs in the Bahamas (New Providence, Cat, Great Abaco, Grand Bahama and Long Islands, all on the Great Bahama Bank; and it is also found on San Salvador). It is a common and widespread species there, and is found in open and slightly deciduous woodland, near fields and along roadsides. The authors have personally collected it on New Providence, Cat, Grand Bahama and Long Island. We have examined over eighty specimens and found three with eyespots, one on which they are quite well developed.

ACKNOWLEDGEMENTS

We thank the Department of Agriculture, and local government of the Bahamas for providing collecting permits. We thank Dr. Jacqueline Miller (McGuire Center, Gainesville) for reviewing the manuscript and providing valuable suggestions, and also for her encouragement on the study of butterflies of the Bahamas. We would also like to thank Drs. Mark J. Simon, Gary Goss, Jacqueline Miller and Deborah Matthews for their expertise and contributions while in the field.

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Life cycle photos of the Apama Hairstreak (*Callophrys affinis apama*). Is Apama gone from Arizona's Sky Islands?

Bill Beck

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Introduction

I was reading "Climate Change and Extinctions at the Edge" on the **dotWild** blog (1). The article describes risks that small and isolated butterfly colonies have for survival. It discusses a New Mexico endemic Coral hairstreak subspecies (*Satyrium titus carrizozo*) of the Sacramento Mountains, a butterfly whose eco-niche is threatened by a warming climate. The very isolated mountain top habitats having host plant (choke cherry) is literally evaporating; this subspecies exists nowhere else. The authors point out that genetic variations evidenced by sub-speciation are valuable "tools" for a species to craft survival in the changing future, suggesting that protecting such subspecies should not be overlooked!

Living in Tucson Arizona, I've become aware of several kinds of hairstreak colonies locally on isolated mountain ranges, mountains called "Madrean Sky Islands". The Santa Catalina mountains just east of Tucson have colonies today of Colorado, Arizona, Thicket, Ilavia, Xami, Gray, Leda, Juniper, Mallow-scrub and Soapberry hairstreaks. And, at least until the 1960's, the Apama hairstreak (*Callophrys affinis apama*) was present too. Historic butterfly collection records exist for Apama from the Catalinas (1960), Chiricahuas (1958), Pinalenos (1964) and Baboquivaris (1924) (2).

Today the Apama **seems** to be missing almost completely from Arizona's Sky Islands (except for the Pinal mountains north near Globe). Maybe this situation has similarities to the *S. t. carrizozo* hairstreak discussed on dotWild? Perhaps different in this case is that Apama typical habitat still seems present and vital on these Sky Islands?

Madrean Sky Islands

Sky Islands are unique in location, (being at the intersection of temperate and subtropic latitudes), by their isolation, and by their separation from each other by a desert habitat barrier that creates ecological "islands". Species exist in their habitat niche as relicts from both the neartic north AND the neotropic south. Certainly the current situation arose from climate shifts evidenced by North American glaciation events. There are interesting research studies available; for instance read: Brusca's "Dramatic response to climate change in the Southwest: Robert Whittaker's 1963 Arizona Mountain plant transect revisited" (3); and Moore's "Introduction to the Arizona Sky Island Arthropod Project (ASAP): Systematics, Biogeography, Ecology, and Population Genetics of Arthropods of the Madrean Sky Islands" (4).

With a single visit its apparent that these Sky Islands are as dramatic and isolated as any island in the ocean. The Catalinas have Sonoran desert (Saguaro cactus!) at the bottom at 2400' ASL. As one drives the General Hitchcock highway to the top, the temperatures drop more than 15F. The top of the mountain at 9157' ASL (well over a mile above the foothills!) has fir, spruce and aspen. The change is reflected in animal communities too.

The Butterfly

Apama Hairstreak (*Callophrys affinis apama*)

Callophrys affinis apama, male, dorsal. Tonto Creek, Arizona.

Callophrys affinis apama, male, ventral. Tonto Creek, Arizona.

The *Callophrys,* subgenus *Callophrys*, is a group of four green hairstreaks in the American west with challenging taxonomic relationships: *C. affinis,* C. *dumetorum, C. perplexa* and *C. sheridani.* This group makes James Scott's list of butterfly "stench-o-species" because research seems

to always raise as many questions as it answers! While the Apama had been generally regarded as its own species (5), it now seems accepted as a sub-species of the *C. affinis* Western Green group (6).

C. affinis are typically single brooded in spring/early summer. Extra elevation or latitude delays can extend their flight. In Arizona the Apama's are typically on wing from May thru June and July. Population maps show *C. affinis* ranges from Canada thru the Rocky Mountains and south into Sonora, Chihuahua, and Durango in Mexico The *C. affinis* biome is defined as, "mountain or steppe habitats between 1372–2500 m throughout the species range" (7).

For the four *Callophrys* (*Callophrys*) green hairstreaks, field identification at some locations (especially north and west) has been sometimes very problematic where any two of the four species (esp. *C. affinis, C. sheridani*) meet BECAUSE wing color and pattern can be identical across species. Warren defines a strategy for identifying sympatric specimens in such cases. Factors include basically flight timing, and mate-locating behavioral tendencies, but also host plant and colony location; recently Gorelick revisits and supports this strategy. (8)(9).

(Observation Note: Warren/Gorelick postulate in their work that *C. affinis* males are hill-toppers, compared to *C. sheridani* that locate lower in draws and roadsides for mate locating; and that this is actionable species identification information. My own observations in Arizona find Apama males locating close to the ground in lower areas and draws (North Rim, Flagstaff, and Alpine colonies) and along roadsides and ditches (Christopher Creek and Pinal mountain colonies). Would not the Warren/Gorelick identification strategy move Apama away from being a *C. affinis* subspecies?)

Unlike most of the *Callophyrs affinis* members which use *Eriogonum* sp. (Polygonaceae) as host, the Apama uses *Ceonothus fenderli* (Rhamnaceae*)* with caterpillars feeding on its flower buds. In fact, the range of Apama almost exactly matches the range of *C. fenderli,* largely in Arizona, New Mexico, Utah, and also Colorado.

As seen in the photo (facing page), Apama adults have distinctive hindwing markings compared to others in the genus; an almost complete post-medial hind-wing line of white with a black and rust inner border. The balance of *C. affinis* range from white hind wing markings to almost none.

Apama Life Cycle Photos

In mid May 2018 my wife Jane and I drove up a mountain to look for this hairstreak on a Sky Island; we found a colony right on and around *Ceanothus fenderli,* of course! A female was kind enough to deposit eggs for these photos.

Upper left: Female *Callophrys affinis apama* laying eggs in, on or close to developing buds of *Ceanothus felderi*. Upper middle: Eggs small and green, and a first instar caterpillar; upon hatching, the caterpillar dives right in to the food. Upper right: First instar, very small and pale yellow. Lower left: Second instar, still very small, but now green. Lower right: Third instar, definitive morphology develops, and color patterns are much more visible.

Top row: Last instar caterpillars with decidedly different color patterns, ranging from completely green to almost completely red; all are from the same batch of eggs. Bottom left: Pupa (which overwinters) and prepupa. Bottom right: Adult female.

The Challenge to Survive on the Edge

"Local" but usually temporary extinctions of butterfly colonies are the norm, not the exception. For a small colony living in small fragmented habitat, there is a long list of challenges (10). Predators, diseases, competition, habitat destruction (fire, drought, urban sprawl), and on and on! Throw in climate change of course! There are current studies showing a broad but significant shift north of most all butterfly species on the east side of North America attributed to changing climate (11).

If a colony is lost within viable habitat, there is really only one way for it to come back. It must be repatriated of course. Some butterfly species have routine migration, but not so much for others like hairstreaks. Famously we see the Monarch, Painted Lady, and Cloudless Sulfur's long distance movements north from Mexico into Arizona every year. Most hairstreaks don't move very far from their colony or good habitat; repatriation of a lost colony must be dependent on habitat "stepping stones" being relatively close. A situation in point is the Organ Mountains Poling's hairstreak in New Mexico (*Satyrium pollingsi organensis*), where Steve Carey has studied the very tenuous populations along a fragmented mountain chain habitat (12). They survive….but just!

Hairstreaks "disperse" in their own fashion. Mostly fertile females have drive to search for new locations when they can. In banner population years there seems to be a stronger dispersion effect (that we see). For example, some years Arizona gets an influx of Silver banded hairstreaks (*Chlorostrymon simaethis*) from Mexico, though there is no viable niche to maintain a permanent resident population here.

Robbins reported a situation where dispersal is by physical factors (ole' Mother Nature)! His study of hairstreaks in Panama shows some species being widely dispersed annually by strong trade winds off the ocean (13). I'd like to watch that! (The typical wind direction in Tucson is decidedly from the south, southwest. There are no colonies of Apama to repatriate from that compass point!)

How did Apama get on the Sky Islands in the first place? And "If they go away for a time, won't they just come back?" If you ask me that, here is the answer as I believe it: Apama didn't travel to "get" here. I believe the Southwest was home; where they came to be. In near history (post and or between Ice Ages) we know that the encompassing region of the Sky Islands was continuous pine/oak/juniper habitat, from California thru New Mexico; just the sort of habitat that Apama likes!

Investigators of packrat middens (artifacts preserved for the last 40,000 years!) found that they contain plant samples that demonstrate this (14). Habitat for widespread existence of the Apama across, over, and around all of the Sky Island mountain ranges has been a historic norm, not the exception!

The Sky Island situation looks to be like the beach when the tide goes out; "at risk" habitats are the tide pools with

their stranded inhabitants (the Sky Island "in negative"). If the tide pool dries up completely, the population perishes. If the pool is big enough or the tide comes back soon enough, everything is refreshed!

The Sky Island Apama hairstreaks have been caught on the mountain by Mother Nature's climate and her "changing tide"! There can be little chance of Apama's repatriating our mountain ranges in our human timeframe, as I believe it would take another Mother Nature shift (with glaciers back!) to "refresh" the pool!

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Use of honeydew by day-flying Lepidoptera during Winter months in south-central Texas: rare occurrence or simply little observed?

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Lepidopteran adults find nourishment from a wide variety of sources, ranging from flower nectar and tree sap (pers. obs.) to dung, carcasses (e.g. Downes 1973, Tooker et. al. 2002), and mud puddles (Adler 1982, Beck et. al. 1999). Another source of insect nutrition is aphid honeydew; ants perhaps most well-known for utilizing this sugar source (eg. Hölldobler & Wilson 1990, Stadler & Dixon 2005). Bumblebees (Batra 1993, Bishop 1994), wasp parasitoids (Short & Steinbauer 2004), solitary bees (Konrad et. al. 2009), stingless bees (Koch, et. al. 2011) and moths (Sansum 2013, Johnson & Stafford 1985, Gardner-Gee, et. al. 2014) also seek nourishment from aphid honeydew (see also Hogervorst, et. al 2007). Butterflies feeding on honeydew are limited to Lycaenidae (Cottrell 1984, Stadler et. al. 2003).

Johnson and Stafford (1985) discussed the lack of reports of adult butterflies feeding on aphid honeydew, noting that many species gain nutrients from sources other than nectar (see also Downes 1973). They suggested "under specific conditions, the ability to efficiently locate and consume honeydew could be important to the survival of many Lepidoptera." Gardener-Gee et. al. (2014) demonstrated that moths fed "extensively" on honeydew following flowering of the kānuka tree in New Zealand, suggesting honeydew may provide an additional food source for pollinators when traditional nectar sources are minimal.

In February 2013 blooming plants at Guadalupe River State Park, Spring Branch, TX were limited in species and number to *Anemone heterophylla, Thamnosma texana, Glandularia pumila, Hymenoxys linearifolia* and

Taraxacum officionale. At the same time a monthly butterfly survey conducted at Guadalupe River State Park yielded 26 species of butterflies (Table 1). While the author has witnessed *Polygonia interrogationis* and *Vanessa atalanta* feed on sap, particularly in late winter and early spring, the diversity of butterflies and the low diversity and number of blooming plants would seem to create a potential food shortage.

On 5 February 2013, and for three weeks, the author witnessed ten species of butterflies (Table 1, in bold) on rosettes of *Carduus nutans*, a common non-native thistle (Figures 1-4). Initially the behavior was discounted as sunning behavior until it was noticed the butterflies seemed to persist on the rosettes for several minutes. Other insects were simultaneously observed on rosettes including ladybird beetles (larvae and adults), *Diabrotica undecimpunctata*, *Apis mellifera*, sweat bees, tachinid and bottle flies of unknown species.

Closer examination of individual butterflies revealed each butterfly's proboscis extended in feeding mode. Continued observation indicated butterflies were feeding on both upper and lower leaf surfaces. Closer examination with a 10x magnifying loupe revealed tiny (<1mm) shiny, sticky droplets scattered on leaves. Turning over leaves revealed aphids of an unknown species. Were droplets from the feeding aphids? A leaf with aphids was collected for examination.

Under a microscope, a honeydew "bubble" formed at the posterior end of the abdomen on one aphid. Within 2-3 seconds, the aphid extended its back left leg and "popped" the bubble, scattering droplets over the leaf surface. This confirmed observed droplets were honeydew. Continued observations confirmed that the butterflies were feeding on honeydew droplets.

With minimal nectar sources available to butterflies during this period of time, butterflies and other insects were taking advantage of a resource the author had never witnessed. While tree sap, dung, carrion and mud puddles are alternate resources for nutrition for Lepidoptera (see Adler 1982), these can be limited and are likely widely scattered and limited in quantity. Finding alternative food sources would necessarily require butterflies to be resourceful. With the diversity of honeydew-producing aphids and known use by a host of insects and even birds (e.g. Gamper & Koptur 2010, Greenberg et.al. 1993), honeydew would certainly seem to be a possible alternative food source, if available in sufficient quantity.

Could "free" honeydew be limited, however, by the relationship between ants and aphids? Is it possible ants actively guarding aphids limit "free" honeydew, making it unavailable to foraging butterflies? During the three weeks this behavior was witnessed, no ants were present. Without ants a localized, temporary, and perhaps rare cornucopia of food may have become available for exploitation by butterflies and other insects.

Table 1. Species of butterflies active January/February 2013. Those in bold were observed feeding on aphid honeydew on thistle leaves between 5 and 24 February.

Battus philenor	*Agraulis vanillae*
Papilio polyxenes	***Euptoieta claudia***
Pontia protodice	*Phyciodes phaon*
Colias eurytheme	*Polygonia interrogationis*
Zerene cesonia	*Nymphalis antiopa*
Abaeis nicippe	***Vanessa atalanta***
Nathalis iole	*Vanessa virginiensis*
Pyrisitia lisa	*Vanessa cardui*
Strymon melinus	***Junonia coenia***
Atlides halesus	*Anaena andria*
Callophrys gryneus	***Libytheana carinenta***
Leptotes marina	*Danaus gilippus*
Echinargus isola	***Pyrgus communis/albescens***

Johnson and Stafford (1985) observed that the "paucity of observation of this behavior" in non-lycaenid Lepidoptera could be the result of the insects being "less conspicuous when feeding on honeydew than when feeding on nectar." Sansum (2013) documents this behavior has "sufficient historical references to honeydew feeding in Europe to at least demonstrate that the habit cannot be rare." That ten species of butterflies were observed feeding on honeydew certainly supports the idea that it "cannot be rare." However if ants do indeed limit "free" honeydew, this potential food source could be rare, thus making this behavior "less conspicuous." It is worthy of note that the author attempted to document this behavior each year since the 2013 observations without success.

Research has demonstrated that butterflies are adaptable in terms of securing food. The use of honeydew as a food source could provide an alternative food source in times of drought or when a paucity of nectar sources exists due to other factors, including time of year. Honeydew is well-known for its nutritional value (Gray & Fraenkel 1954) to ants and a host of other insects, including Lepidoptera. Future research of honeydew feeding by butterflies may expand understanding of dietary flexibility of butterflies, expand our understanding of interactions between butterflies and aphids, and how ant-guarding affects availability of honeydew to butterflies and other insects.

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Figs 1-4. Butterflies feeding on aphid honeydew on thistles. 1) *Strymon melinus* (foreground) and *Libytheana carinenta* (background, right). 2) *Euptoieta claudia*. 3) *Atlides halesus*. 4.) Two *Libytheana carinenta* (lower left/right). (Figs. 1, 2 & 4: photos by C. Hensley; Fig. 3: photo by T. Kiphart)

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Oeneis alberta (Nymphalidae) and relatives *O. calais* and *O. chryxus*: early stages, evolution, and the life style species concept

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Oeneis alberta is a special butterfly. Its range is large, in cool upper-montane dry grassland prairie from Canada to Arizona, in high mountains and the northern Great Plains. Yet it occupies few places in the U.S., and may be vulnerable to extirpation due to global warming. The early stages of boreal Satyrinae take many months in the lab, but I have finally reared many of them. This article presents discoveries to help understand this poorly-known species and its relatives and their biology and identification.

Early stages of *O. alberta* (Park Co. Colo.). The hostplant in Colorado is *Festuca idahoensis*, a moderately-large bunchgrass in prairie or sparse-sagebrush; hostplants elsewhere are undocumented. Eggs are cream with ~20-21 vertical ribs on the sides, and many bumps on top, similar to *Neominois* eggs. 1st-stage larvae have just brown primary setae like most butterflies, with a plain light-brown head, and body stripes like those of older larvae. They are slightly greener after eating. 2nd-5th-(mature) stage larvae have vertical brown stripes on the head, the first two stripes varying from medium to very wide in width, averaging wider than *O. calais*/*O. chryxus* (the 3rd lateral stripe is always small). The larval body color bands are the same in position and approximate coloration as those of other *Oeneis* and *Neominois*. Older larvae have the heart-band varying from a row of black and tan dashes to sometimes near-solid blackish; some Alta. larvae may be greenish esp. laterally. The pupa is pinkish cream (often greener in Alta.), within a day becoming blackish-brown on appendages and orbit and wings except the wing veins are peculiarly cream (this pattern of pale veins on dark wing may be limited to *O. alberta*/*O. calais*/*O. chryxus* [the *O. nevadensis* pupa is unknown], as *O. jutta* has a tan wing with blackish veins); near emergence the pupa becomes mostly blacker.

Early stages of *O. alberta* are similar to *O. calais* and *O. chryxus* (all illustrated here), but the egg seems to have straighter vertical ribs (*O. chryxus* has jagged ribs), and various bands on the 1st-stage larvae seem to be just brownish or slightly reddish-brown in *O. alberta*, versus reddish-brown in *O. calais*, and brownish-red in *O. chryxus*. On older larvae, the head stripes average wider in *O. alberta*; the heart-band is most often a row of dark and pale dashes in *O. alberta* and *O. calais*, usually a solid stripe in *O. chryxus*. Pupae look very similar.

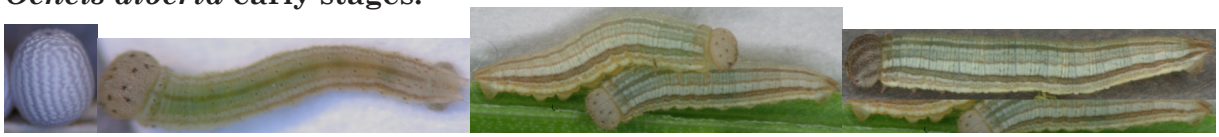
Early stages are also similar to *Neominois*, especially the larvae which are remarkably similar (*N. ridingsii curicata* is shown here for the first time, and Scott [2008a, b, 2014a] details *N. r. coloalbiterra*, *N. r. wyomingo*, and *N. r. ridingsii* early stages [the latter two seem to have paler larvae]). All *Oeneis* and *Neominois* have the same older-larva bands, though the coloration of bands differs somewhat (Scott 1986 mostly summarizes descriptions by W. H. Edwards). Some older *Neominois* larvae (*curicata*, *ridingsii*, *wyomingo*) are sometimes somewhat greenish. The main differences are the *Neominois* egg has narrower ridges, and the pupa is mostly unmarked and lacks the brown and tan wing markings of *Oeneis*. *Neominois* has been placed into *Oeneis*, but its genitalia (Tomas Pyrcz study of my specimens) and wing pattern differ.

Hibernation stage is fully-fed mature larva in annual *O. alberta*, 2nd-3rd (sometimes late 1st) and 4th-5th-(mature but not fully-fed) stage larvae in biennial *O. calais altacordillera* and other *O. calais* ssp., late 1st-2nd (perhaps 3rd) and early 5th (and surely 4th) stage for biennial *O. chryxus*. 4th-stage larvae hibernate in *Neominois* ssp. (*ridingsii*, *coloalbiterra*, etc.), except 1st-stage larvae hibernate in *N. r. wyomingo* (biennial *N. r. pallidus* probably hibernates in both stages).

Identification. Adults of *O. alberta* and all the ssp. formerly lumped into *O. chryxus* actually most resemble *O. calais* (those lumped ssp. belong to *O. calais*), and differ from true *O. chryxus*, as the photos of males show. All three species have a broad jagged median band (formed of black edged by white) on the finely-brown-striated ventral hindwing.

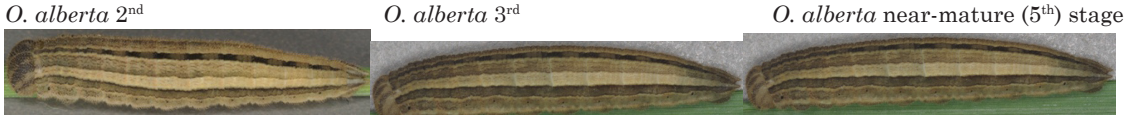
O. calais altacordillera—the ssp. that I named in 2006 which greatly overlaps in range with *O. chryxus*—males are distinguished from *O. chryxus* using the following traits: 1) males have a smaller stigma (which extends less into the discal cell, just 0-1mm--actually 10-15% of *altacordillera* males appear to have no dark stigma at all [put a strong light behind the wing to see the stigma well]), 2) the male dorsal fw is browner because the brown basal area usually extends out to the postmedian line, 3) the veins beyond that are usually wider brown (due to extra brown scales), 4) the hw fringe is less checkered (mostly just brown & tan), 5) that postmedian line jogs outward along vein M_3 farther on average, 6) the fw margin is rather convex. These are averages of considerable variation, but males can usually be identified and the altitude, habitat and mate-location site helps (females are

Oeneis alberta early stages:



O. alberta egg *O. alberta* 1st stage *O. alberta* 1st stage *O. alberta* 2nd stage

O. alberta 2nd *O. alberta* 3rd *O. alberta* near-mature (5th) stage



O. alberta three mature larvae

O. alberta two mature larvae

O. alberta pupa *O. alberta* pupa *O. alberta* old pupa

Oeneis calais altacordillera early stages:

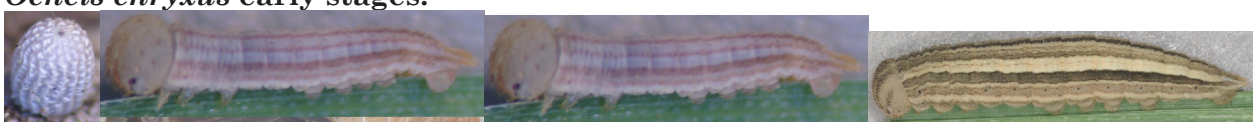
altacordillera egg & 1st stage larva *altacordillera* 1st stage larva

O. calais altacordillera three mature larvae

O. calais altacordillera three mature larvae

O. calais altacordillera three younger pupae and one old pupa

Oeneis chryxus early stages:



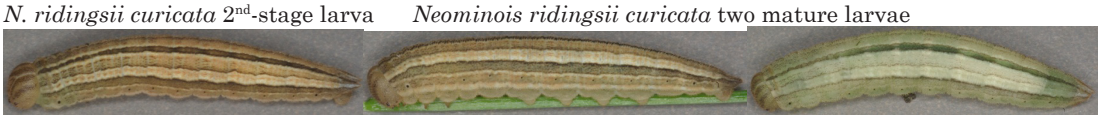
O. chryxus egg & 1st stage larva *O. chryxus* 1st stage larva *O. chryxus* mature larva

O. chryxus two mature larva *O. chryxus* pupa & mature head shell

Neominois ridingsii curicata early stages:

Neominois ridingsii curicata egg & 1st-stage larva *N. r. curicata* 2nd stage larvae

N. ridingsii curicata 2nd-stage larva *Neominois ridingsii curicata* two mature larvae

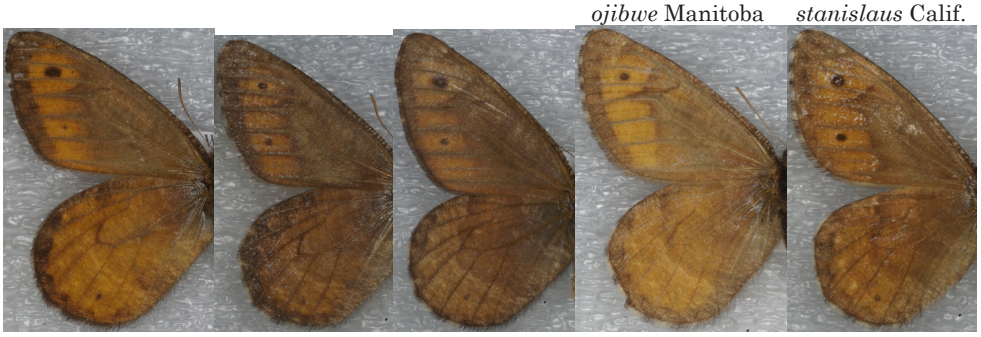


Neominois ridingsii curicata three mature larvae; larva to right is greenish form

N. r. curicata mature larva *Neominois ridingsii curicata* pupae

Male *O. alberta*, *O. calais*, *O. chryxus*, *O. nevadensis*

O. alberta Park Co. Colo. three *O. alberta ojibwe* Manitoba *O. calais stanislaus* Calif.



O. calais altacordillera Clear Creek Co., Colo. three; *O. c. altacordillera* Custer Co., Colo. two

O. calais calais Manitoba *O. calais "caryi"* Yukon *O. chryxus* Jefferson Co. CO three *O. nevadensis* Ore.

difficult to identify). The ups color of male *altacordillera* varies somewhat, from the usual orangish to yellower or rarely cream colored or occasionally even solid brown with no dorsal markings at all (*O. chryxus* is much less variable, usually orangish). The life cycle of *altacordillera* is biennial, but adults fly every year in all known locales.

O. alberta is generally smaller. *O. alb*erta and the other *O. calais* ssp. usually have the same above traits of small stigma (absent or nearly so in *O. alberta*), the darker dorsal fw and wider veins and less-checkered hindwing fringe etc. *O. alberta* is most often grayer on ups but has oranger ssp. in SE Manitoba (*O. a. ojibwe*) and the Peace River area of Alta.-BC, which are colored more similarly to *O. calais*.

O. calais altacordillera was formerly confused with *O. chryxus*, but after decades of studying their mate-locating and oviposition behavior/hostplants and finally the details of wing pattern etc., it became obvious that they are distinct species, which overlap in range and are sympatric in at least 21 localities from Colo. to Alberta (see Scott 2006, and Scott et al. 2014b and references cited therein). *O. c. altacordillera* occurs from New Mex. to to BC/Alta. in montane grassy places and treeless alpine tundra. Other *O. calais* ssp. occur in Alaska and most of Canada to Quebec. {More ssp. of *O. calais*: Nice & Shapiro [2001] suggested that Calif. *O. calais ivallda/stanislaus* evolved from Snake

Range Nev. *Oeneis*, where only *O. calais altacordillera* occurs. And Alaskan *tanana* is a ssp. of *O. calais* that has evidently introgressed with *O. bore* to get a usually stronger ventral hindwing whitish band, and some Yukon *O. c.* "*caryi*" have DNA and phenotypes resembling *O. c. tanana*, which is not a "hybrid species" because *tanana* occurs with normal *O. bore*. Other ssp. are *O. calais valerata, O. calais strigulosa* and *O. calais socorro*.}

True *O. chryxus* has no subspecies, and actually shows considerable similarity to *O. nevadensis* dorsally as the photos show (the ventral hindwing of *nevadensis* differs somewhat). Males of *O. chryxus* are orangish like most *O. c. altacordillera*, but usually have a larger stigma which extends 1-2mm into the dorsal forewing discal cell (a light underneath the fw helps see this). Males have that wing oranger because the basal brown area is usually smaller and the oranger distal area larger than *calais*. The forewing veins generally lack as much brown edging, the postmedian line on dorsal fw is often absent posteriorly and it jogs outward along vein M_3 on average less than *calais*. The hw fringe is more checkered whitish & brown, and the fw margin is often straighter (less convex). There is some variation in these traits, so some individuals are difficult to identify, but by using them and the altitude/locality of capture, the habitat (in or near open woods or not) and mate-locating behavior (hilltopping in Colo. *chryxus*) one can identify most males. *O. chryxus* occupies foothills to Montane Zone pine woods, and occurs from the Southern Rocky Mts. northward (including the Egan Range in Nevada) to Montana and Wash. (Okanogan Co. eastward at least) and to the northernmost Rocky Mts. at the Racing River in BC. It has a biennial flight in most areas, usually in even years in most of U.S., but in odd years in N-C Wyoming and evidently in Okanogan Co. Wash.

Now we can construct the evolutionary origin of these *Oeneis*. They are closely related on one evolutionary branch, based on the early stages, adult wing pattern and valva lobe. *O. calais* is very widespread and polymorphic (ranging over most of boreal North America from Quebec to Alaska south to New Mexico and California) and occupies most of the phylogeny branch; it has primitive oviposition on sunlit grasses/sedges in open areas, and mate-location occurs in swales, where males rait (rest and watch to await females). *O. alberta* is very similar in wing pattern (except adults tend to be smaller and grayer on ups, and have little or no stigma), oviposits on sunlit prairie grasses and also mate-locates in swales; it represents an evolutionary offshoot of an *O. calais*-like ancestor, and occupies cool prairies early in the season, evolving hibernation as fully-fed mature larva to position the flight period in late spring. *O. chryxus* is evidently a highly-specialized offshoot of the *O. calais* ancestor, and the different *chryxus* wing pattern shows some similarity to *O. nevadensis*. {*O. nevadensis* evidently arose nearer the base of the whole branch; with its 1st-stage larva having reddish bands like *O. chryxus*, and its older larva similar to the others and sometimes greenish, with narrow to wider head stripes [medial head stripe wider than next], the older body stripes similar [#1 heart band has dashes anteriorly, stripes #2 & 3 somewhat pale, #5 is greenish-tan], based on W. H. Edwards and Allen et al. 2005 and James & Nunnallee 2011.} *O. chryxus* evolved in warmer pine forests, where it oviposits on fallen or attached twigs/branches below pine trees that shade mats of sedge growing directly under the tree (the tiny larva evidently drops onto the sedge, where the cool temperature requires a biennial life cycle even in the mountain foothills); it evolved raiting on hilltops (males rest and watch to await females there). (These *Oeneis* mate-locate all day, whereas *Neominois* mate-locate only in morning ~7:50-11:00 rarely to ~noon, in swales in most ssp. but on hilltops in ssp. *ridingsii*.)

Oeneis are difficult butterflies to study and determine species limits, because they vary greatly in wing pattern and genitalia. Reproductive isolation seems to occur between *O. calais altacordillera* and *O. chryxus*, evidenced by huge overlap of ranges encompassing many sites of sympatry. I have not found *O. alberta* flying with either of those, although it probably occurs with those two at some places around South Park (and did in Middle Park) and with one or the other northward; it flies next to *O. calais calais* in E Central Alta. (it flies with *O. uhleri* in South Park and SE Alta.). *O. calais* evidently introgressed with *O. bore* in Alaska in the past to produce *O. calais tanana* (all four species and *O. nevadensis* form the *O. bore* group sharing a basal process on the male valva; the *O. bore* larva is also similar to *O. calais*/*O. chryxus*). It seems that the "**life style species concept**" is very useful in helping define similar *Oeneis* species. *O. alberta* has the life style of occupying cool prairies early in the season, using its unique fully-fed-mature-larva hibernation to fly in spring (the other *Oeneis* hibernate as somewhat young than older larvae), and its presumed annual life cycle is permitted by small adult size. *Oeneis calais* has a generalized life style of occurring on grassy places at high latitude/altitude (Montane/Canadian Zone to tundra where the biennial life cycle fits its cooler higher habitat) where swales are common for mate-location, and it oviposits and feeds on sunlit grasses and sedges (Scott 2014b records four grasses and a sedge as *altacordillera* hostplants). *Oeneis chryxus* has a unique peculiar life style of ovipositing on shaded twigs/branches under mostly-pine trees just above sedge mats (Scott 2014b records details for 63 eggs found there, on five *Carex* [rarely grass *Poa pratensis* etc.], esp. above *Carex rossii*) where the cool shade requires a biennial life cycle, and those sedge mats are common on gentle forested ridges so the males rait on hilltop clearings where they rest and watch and wait for females to arrive. *O. chryxus* is the only biennial butterfly in the lower-altitude Rocky Mts. (*O. jutta* is biennial at middle altitudes), and cannot occur in high-altitude Spruce forests because their branches grow down to the ground and shade and kill all plants under the trees. True *O. chryxus* is shockingly different from *O. calais* and *O. alberta* in life style and is a totally distinct

species, despite the similar appearance of many adults. In Asia the life style species concept also works to separate *Oeneis jutta* and *O. magna*, which look very similar but have very different habitats and life styles.

Conservation. The small dispersed sites where *O. alberta* occurs cause concern about its conservation. Global warming will probably negatively affect the colonies of this species, as they will not be able to move fast enough toward higher/cooler areas. Already *O. alberta* is absent in the place where it was first found in Middle Park in Grand Co. Colo., perhaps in part due to collecting (although a nearby better-looking site also lacks it), and I have not found it in Middle Park despite some search. Ted Pike found it disappeared in Calgary Alta. the last decade, and it is now absent at some sites in North Dakota. *O. alberta daura* disappeared at the type locality Mt. Graham Pinaleño Mts. Ariz. *Neominois* is already affected, as *N. r. wyomingo* disappeared from its colony in Rocky Mtn. Nat. Park Colo., evidently due to global warming because no collecting was done there recently. And *N. r. ridingsii* seems to have disappeared from the grassland just SE of Denver and the mts. westward, where I once found it, and I had to drive nearly to the Wyoming state line to find *N. r. ridingsii* females to rear it.

Common name. *Oeneis alberta oslari* is involved in a sordid story of mislabeled collection data. Ernest J. Oslar first collected it evidently in South Park, Colo. in spring, then mislabeled them Deer Creek Canyon [Jefferson Co.} Colo. Sept. 25, 1909 then sold them, which fooled other people for ~29 years until Bernard Rotger rediscovered it in South Park in early 1938. An investigation of numerous insect publications and Oslar's remaining collection of ~2159 butterflies in the C. P. Gillette Museum at Colorado State Univ. by Scott (2016) revealed that he mislabeled numerous specimens--including 29 butterfly species plus numerous other insects--from states where they do not occur. Oslar collected at least 50,000 specimens of insects (probably several hundred thousand) and sold them worldwide to taxonomists etc., including *Oeneis alberta oslari* from Colorado. Ironically, those taxonomists named at least 26 species/genera after Oslar, without knowing that he sold many thousand mislabeled specimens. Because of this mislabeling, common names should not use the name Oslar, and the common name of O. *a. oslari* should not be Oslar's Arctic. This decision is made easier because ssp. *oslari* appears to be a synonym of ssp. *alberta* (TL Alberta) anyway, as the butterflies are quite variable and look similar in series.

The horrible nomenclatural problems involving the name *chryxus* were fixed by Scott (2014b) by designating a neotype from Jefferson Co. Colo. using the proper interpretation of the 4th edition of the ICZN Code. An earlier-designated unidentifiable lectotype female is invalid because only the lost obviously-holotype male closely matching the neotype was mentioned [& figured] in the original description of *Chionobas chryxus* by E. Doubleday and a second associated paper by J. Westwood. In another publication Doubleday may have included the invalid lectotype female as one of three specimens he called merely "Chionabas ---- ? a—c. Rocky Mountains, North America. Presented by the Earl of Derby" [*Chionabas* is a misspelling], therefore there is no proof that Doubleday considered that female to be the same taxon as *Chionobas chryxus*, and the ? means that he wasn't even sure that the invalid lectotype female was in the genus/species *Oeneis* = *Chionobas*. Thus the invalid lectotype is not a syntype so cannot be designated lectotype, and that female lectotype is grossly different from the male holotype and is unidentifiable and has only a locality of "Rocky Mts." The Code permits the designation of a neotype to properly define a taxon even if paratypes are extant (Art. 75.1), in case someone considers the invalid lectotype female to be a dubious paratype. We don't even know for sure that the holotype male and invalid lectotype female and another female labeled Rocky Mountains were part of that Doubleday phrase "Chionabas ---- ? a—c", because Doubleday couldn't count very well and Doubleday's 1845 list of Lepidoptera specimens in the British Museum Nat. Hist. missed 29 of the 50 known specimens presented by the Earl of Derby and missed whole species presented, and got many of the numbers wrong (Scott 2014c).

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James, D., & D. Nunnallee. 2011. Life histories of Cascadia butterflies. Oregon State Univ. Press, Corvallis. 447 p.

Nice, C., & A. Shapiro. 2001. Patterns of morphological, biochemical, & molecular evolution in the *Oeneis chryxus* complex (Lepid., Satyridae), a test of historical biogeographical hypotheses. Molecular Phylogenetics & Evolution 20:111-123.

Scott, J. 1986. The butterflies of North America, a natural history and field guide. Stanford Univ. Press, Stanford, Calif. 583 p.

Scott, J. 2006. *Oeneis calais altacordillera* J. Scott, new subspecies. Papilio (New Series) 12:14-22 (related papers pp. 22-28).

Scott, J. 2008a. *Neominois ridingsii coloalbiterra* natural history and early stages. Papilio (New Series) 18:16-21 & pl V.

Scott, J. 2008b. Early stages of *Oeneis calais altacordillera*. Papilio (New Series) 18:25-29.

Scott, J. 2014a. *Neominois ridingsii wyomingo* early stages and natural history (Nymphalidae). Papilio (New Series) 22:16-20.

Scott, J. 2014b. *Oeneis chryxus* and *Oeneis calais altacordillera*: types and life histories (Nymphalidae). Papilio (New Series) 22:20-28.

Scott, J. 2014c. Rocky Mountains butterfly specimens donated by the Earl of Derby to the BMNH, including those listed by Doubleday (1845, 1847, 1848) and those not listed by Doubleday but present in that museum. Papilio (New Series) 22:64-69.

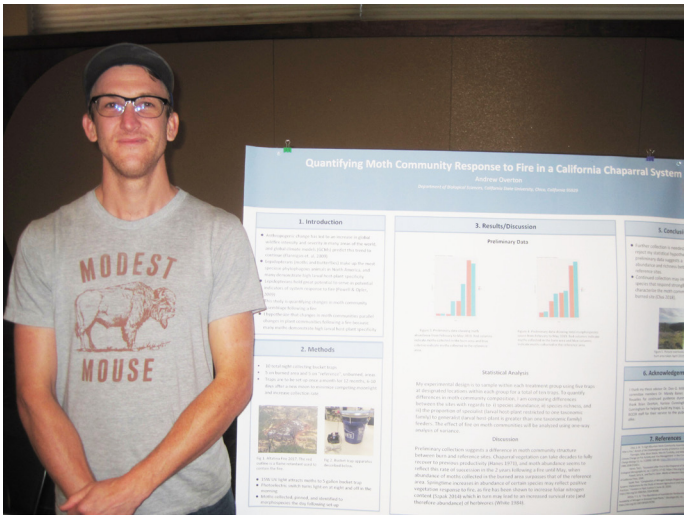
Scott, J. 2016. Ernest J. Oslar, 1858-1944: his travel and collection itinerary, and his butterflies. Papilio (New Series) 25:1-40.

68th Lep Soc meeting news

Photos on the following pages are by Ranger Steve Mueller unless otherwise specified

2019 Lep Soc Awards -- *James K. Adams*

The Harry K. Clench awards for student papers (1st Place $500.00, 2nd Place $250.00) were presented to the following: first place went to Ryan St. Laurent for his presentation "*Zaphanta*, the sister group to all other sack-bearer moths." The second place award was presented to Ana Paula Carvalho for her presentation "The association of sexual arms race and diversification in Acraeini butterflies." The 2nd Place ($175.00) Alexander B. Klots Award for posters was awarded to Andrew Overton for his poster "Quantifying Moth Community Response to Fire in a California Chaparral System" (the committee decided not to award a first place winner). Congratulations to the winners!!



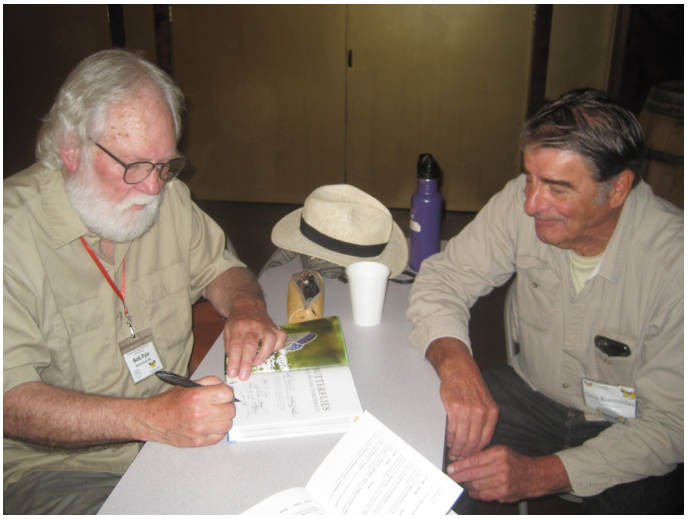
Andrew Overton, 2nd place winner for the Alexander B. Klots poster award.

Bill Patterson and Doris Brown. Although they didn't win an award, they could for "cute space filler" on this page!

President Brian Scholtens presenting the first place Harry K. Clench Award to Ryan St. Laurent.

President Brian Scholtens presenting the second place Harry K. Clench Awards to Ana Paula Carvalho.

The two Harry K. Clench Awards, Ryan St. Laurent and Ana Paula Carvalho, looking pretty content!



Bob Pyle, signing a book for Greg Kareofe

Caitlin LaBar, at the book signing, with Nick Grishin

Mary Ellen Hannibel, signing a book for Bill Patterson

Keith Summerville, Journal Editor, with our new president, Alma Solis

Jeff Smith, meeting organizer and chairperson

Dave Wagner and Michael Collins

The Pacific Slope contingent -- back row: Charles Brandau, Todd Gilligan, David Bettman, Chris Grinter, John Lane, Bob Pyle, Bill Patterson, Paul Opler. **Front row:** Bill Shepard, Paul Johnson, Kelly Richers, Chuck Harp, Mike Collins.

Megan and David McCarty

Pacific slope photo by Evi Buckner-Opler

The women with Lepidoptera attire -- back row: Caitlin LaBar, Evi Buckner-Opler. **Front row:** Suzette Slocomb, Mary Miller (Beck), Ana Paula Carvalho.

Daniel Rubinoff, Ric Peigler, and Paul Opler

John Lane and Debbie Matthews (Mike Holy behind Debbie)

Chris Grinter and Steve Nanz

Membership

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

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

Dues Rate

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

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

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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:

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Journal of The Lepidopterists' Society

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

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Submission Guidelines for the News

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

1. Electronically transmitted file and graphics — in some acceptable format — via e-mail. Graphics/figures should be at least 1200 x 1500 pixels/inch^2 for interior use, 1800 x 2100 for covers.

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

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

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

Submission Deadlines

Material for Vol. 59 and 60 must reach the Editor by the following dates:

Issue		Date Due
61	4 Winter	November 15, 2019
62	1 Spring	February 15, 2020
	2 Summer	May 12, 2020
	3 Fall	August 15, 2020

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

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

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Refer to Season Summary for Zone coverage details.

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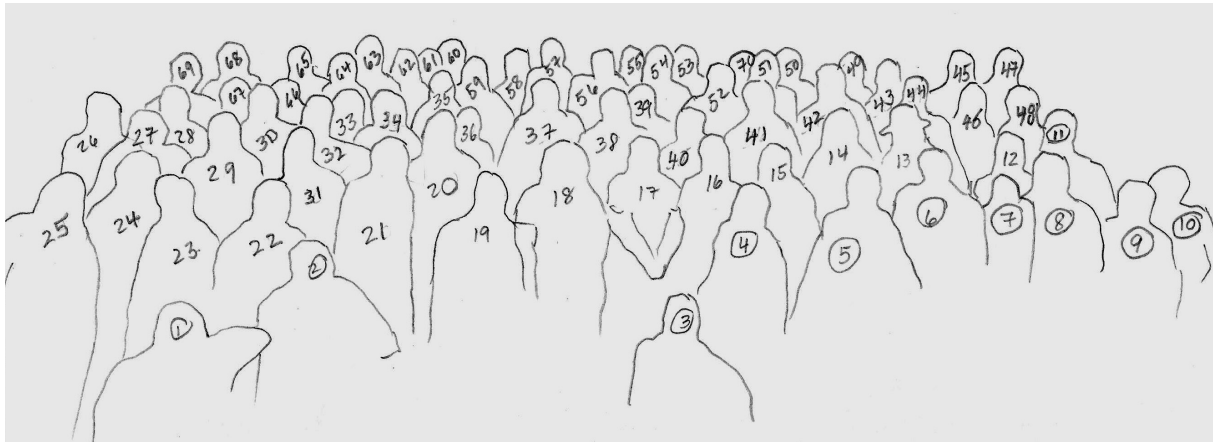
68th Annual Lep Soc Meeting Attendees University of California Davis, Davis, California, July 9 - 13, 2019



1. Mike Singer, 2. Wayne Wehling, 3. Kara Anderson, 4. Tristan Savela, 5. Sangmi Lee, 6. Chuck Harp, 7. Evi Buckner-Opler, 8. John DeBenedictis, 9. Martha McCorkell, 10. Jackie Miller, 11. Dave Wagner, 12. Megan McCarty, 13. Mike Collins, 14. Yvonne Garzon, 15. Ana Carvalho, 16. Sarah Troup, 17. Shannon Summers, 18. Mary Miller (Beck), 19. Joan Epstein, 20. Marc Epstein, 21. Joey Epstein, 22. Doris Brown, 23. Mary-Ellen Hannibal, 24. Bob Pyle, 25. Suzanne Slocomb, 26. Markku Savela, 27. Paul Opler, 28. Tom Velat, 29. Paul Johnson, 30. Michael Young, 31. Debbie Matthews, 32. Melissa Moran-Hodge, 33. Patricia Moran-Hodge, 34. John Beck, 35. Nick Grishin, 36. Rob Fernau, 37. Kim Garwood, 38. Ian Watkison, 39. Grayson Spomer, 40. Judy Watkinson, 41. Ryan St.Laurent, 42. John Lane, 43. Jonathan Xing, 44. Todd Gilligan, 45. David McCarty, 46. Steve Nanz, 47. Jeff Smith, 48. Kuiyi Xing, 49. Brian Scholtens, 50. Ranger Steve Mueller, 51. Karl Gardener, 52. Dan Rubinoff, 53. Greg Kareofelas, 54. Caitlin LaBar, 55. Terry Lott, 56. Bill Patterson, 57. Jonathan Pelham, 58. Kelly Richers (try to see the Praying Mantis he's holding!), 59. Bill Shepard, 60. Clinton Kellner, 61. Mike Holy, 62. Kyhl Austin, 63. David Bettman, 64. Chris Grinter, 65. David Lee Meyers, 66. Mia Lippey, 67. Melanie Lalonde, 68. Ric Peigler, 69. Tyson Wepprich, 70. Steve Spomer. **Conference Attendees not Pictured:** Charles Brandau, Erin Diehm, Rich Kelson, Lawrence Crabtree, Jan Metlevski, Al Luedtke, Raymond White