



THE PYRALOID PLANET

Volume 8 – 20 June 2014
A newsletter for the Pyraloidea fans

Editorial

Dear Pyraloidea fans,

Welcome to the 8th edition of our newsletter. I hope that you had or are having a good collecting season. Here in Switzerland we were experiencing our first hot spell just recently and although I saw lots of moths at light, I wasn't very lucky with pyraloids.

Collecting is a primordial component of our research and more important than ever in the current sorry state of nature conservation. Thus, I was glad to read a letter in support of collecting in *Science* recently (see <http://www.sciencemag.org/content/344/6186.toc#Letters>). It seems to be more complex now to go out collecting, borrow and loan specimens, obtain funding for collections maintenance and improvement, and publish taxonomy, than it was in the past. One more possible obstacle

will be the regulation on access to genetic resources, the "ABS Regulation" in short (see <http://register.consilium.europa.eu/doc/srv?l=EN&f=PE%20131%202013%20INIT>), which was adopted by the Parliament and Council of the European Union and several countries. As its Article 1 reads, "this Regulation establishes rules governing compliance with access and benefit-sharing for genetic resources and traditional knowledge associated with genetic resources in accordance with the provisions of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity." When ratified by at least 50 states, the Nagoya Protocol will take effect, and this is scheduled to happen in 2015. I assume that the Nagoya Protocol is



A new genus and species of Midilinae from the Serra Bonita Reserve, Bahia, Brazil, currently being described by Vitor Becker. Photo by B. Landry.

This issue was made possible with the help of Todd Gilligan, John Hawking, James Hayden, Sangmi Lee, Houhun Li, Richard Mally, Shankar Murthy, Hideshi Naka, Matthias Nuss, Harsimran Singh, Alma Solis, and Stephen Sutton.

The logo of The Pyraloid Planet was created by Florence Marteau of the Muséum d'histoire naturelle, Geneva, Switzerland, and the layout of this issue was made by Corinne Charvet of the same institution.

not against collecting with proper authorizations, but it will probably impact on our work. For example, article 28 mentions that “a system of registered collections within the Union should be put in place through the establishment of a voluntary register of collections to be maintained by the Commission. Such a system would ensure that collections included in the register effectively apply measures restricting the supply of samples of genetic resources to third persons with documentation providing evidence of legal access, and ensure the establishment of mutually agreed terms, where required.” More in years to come...

On a personal note my trip to Brazil at the end of last year was great as I was able to sample several new habitats, thanks to the help and guidance of Vitor Becker. I have made no plans to organize a real collecting expedition this year. Instead I hope to finish some manuscripts and visit the Natural History Museum, London. Given the lack of technical assistance I am faced with and the extra administrative duties that fell on me since early last year, I must target fewer taxa in the field and take extra care in planning my work time. In this context, I am really VERY much grateful to those of you who responded positively to Théo Léger's request last year (see PP 7: 4–5) for Crambinae and Scopariinae specimens in ethanol for our phylogeny project with Matthias Nuss. Please don't forget us if you haven't sent us material yet and planned to do so! We are still missing many taxa.

I thank the contributors to this issue, which I hope you will find entertaining, or at least interesting! The references cited in the texts can be found in GlobIZ (www.pyraloidea.org), unless otherwise stated. As usual please don't hesitate to recruit new pyraloid fans by disseminating this issue widely or otherwise, send any change of address before the next issue, and feel free to let me know if you would like to edit the next issue.

Cheers,

Bernard Landry

GlobIZ News 2014

During the last 12 months, the number of valid species included in the Global Information System on Pyraloidea (GlobIZ)

increased by 688 (+ 311 synonyms) to a total of 14,823 (+ 5,949 synonyms). Nearly 4,800 changes were made by five contributors to GlobIZ pages. These counts well demonstrate the increasing efforts made to improve the quality of the data in contrast to the sole addition of new records to the database.

In 2011, for Zootaxa's special issue on animal biodiversity, we provided a count of 15,579 pyraloid species (Nieukerken et al., 2011) for which we calculated the number of species per subfamily using GlobIZ as well as LepIndex. Already in 2012, we announced that the calculated number for crambines was exceeding the previous year's count. Since then, the count slightly exceeds that for other subfamilies too by a few species, or several dozens, as in Spilomelinae. Richard Mally, who is busy with the latter taxon, says that it is not the end of the line. Let's look for the progress during the next twelve months, and as usual to conclude this news item: Everybody is welcome to take part in GlobIZ!

Matthias Nuss

Systematics and Ecology of the Australian Aquatic Moths, Acentropinae

The Aquatic Moths, Acentropinae (Crambidae) of Australia were revised by the traditional morphological taxonomic techniques of wing patterns, wing venation and genitalia of the males, which were complemented by adding larval morphology, larval ecology and molecular sequencing. The revision recognised 17 genera, with 54 species, of which seven genera and 10 species were undescribed. Forty one species were consistent with 10 described genera, *Anydraula*, *Elophila*, *Eoophyla*, *Margarosticha*, *Nymphicula*, *Paracataclysta*, *Paracymoriza*, *Parapoynx*, *Strepsinoma* and *Teterrinia*, and 11 species were consistent with seven undescribed genera. Three genera, *Hylebates*, *Nyctiplanes* and *Neoshoenobia* were inconsistent with the Acentropinae and were removed. Taxonomic descriptions, plus taxonomic keys of the adults were given for the genera and species.

The larval morphology contained apomorphic characters which supported taxonomic placement of many species. The larval characters provided diagnostic apomorphic characters which distinguished 20 previously misplaced species and confirmed the generic placement of 11 species. The structure of the forecoxae was found to be a major diagnostic character state which allowed generic placement of species. This character was strongly supported by other morphological characters (breathing apparatus structure and arrangement, head direction and mandible form) and ecological parameters (habit, habitat, food type and case or retreat type).

The CO1 gene inferred the association of 31 larvae with their respective adults, with the larval taxonomy supported by diagnostic morphological characters. The CAD, CAD+CO1 and CO1 gene trees inferred generic and specific relationships, and phylogeny, which were supported by the traditional morphological descriptions of the adults.

The larval morphology, larval ecology and molecular sequencing greatly increased the quantity of taxonomic information and character states to provide an informed systematic placement of Australian acentropine species. The knowledge gained will allow a more critical evaluation of the world Acentropinae fauna and the use of these techniques will help resolve some of the taxonomic impediments currently experienced in the systematics of the Australasian and Oriental faunas.

John Hawking

An illustrated guide to the Thyridoid & Pyraloid Moths of Borneo

The macro-moths of Borneo are now well known, thanks to the 30 years of sustained effort of Jeremy Holloway with the support of Henry Barlow through Southdene Sdn Bhd. Among the 'micros' of Borneo the Pyraloidea have long stood out as a group crying for attention. They are abundant and highly diverse, collections are available for study

and much preliminary work has been done to make sense of the generic structure and species groups. However, with a likely minimum of 2500 species, at least 50 person-years would be needed to revise genera and name species, and time is pressing.

With this in mind, in 2004 Henry Barlow initiated the production of 'An Illustrated Guide to the Pyraloid Moths of Borneo' to be published in book form, as a bridge to the eventual production of taxonomic monographs. Note that the concept was (and remains) of an *illustrated guide* with no attempt to formally *name* species or revise genera. He recruited Terry Whitaker and Stephen Sutton to assist. We added some 300 species of thyridoids to this project because they were 'joined at the hip' with pyraloids in the earlier literature and make a group of more convenient size to work up before entering the formidably speciose pyraloid jungle.

In 2009 we realized that the medium of the printed page was unsuitable for an illustrated guide of a group with a rapidly evolving taxonomy and burgeoning number of described species and identifiable morphotypes, and that a website, with all the flexibility it provided for use and updating, was the best way forward.

We are now happy to introduce to you, the members of the Pyraloid Planet (PP) collaborative network (or collective for short), the first phase of the website, comprising 295 described species and morphotypes at or near the species level (designated as 'sp.1', 'sp.2', etc.). For us the PP is an extremely valuable organisation to act as a sounding board and hopefully to produce a team to eventually take over the development of the site.

We currently have some 2500 species/morphotypes of pyraloids in Borneo (in the approximate ratio of 55:45) in an advanced

stage of preparation for uploading as Phase 2 of the website development. Extensive data from specimen labels and the literature has been collected by TMW, and some 4,500 images have been prepared by Southdene. The challenge now is to distil these data and images into uploads to the website and find a provisional sub-family and generic structure to provide a framework.



Dysodia sp.14, an unnamed specimen from Sabah, Mt. Kinabalu N.P., Poring Hot Springs.

PYRALIDS of BORNEO AN ILLUSTRATED GUIDE

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Identify Images & text

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At the top of the species' page there is a **Title Line** on the right side and a series of **Tabs** on the left. Tabs 1-5 currently have content. The others are for future use.

Camadenia tessellata Swinhoe, 1904; Plate 3

Title Line

Tabs providing content for each species

Taxonomy

W. Malaysia, GTE. The holotype of *Hypolamprus tessellata* Swinhoe, 1904:422 is from Sumatra (Padang). Ms. comb. n. to *Camadenia* (Shaffer, 1992 LepIndex).

KEY TO TABS
(1) Taxonomy, (2) Description, (3) Distribution & Habitat, (4) Life History & Pest Status, (5) Similar spp., (6) Related spp., (7) References, (8) Genitalia, (9) DNA Barcode, (10) 3D Imaging, (11) Spare

Tab 1 is 'Taxonomy'.
The locality of the imaged specimen e.g. 'W. Malaysia, GTE.' (Genting Tea Estate) is given 1st, followed by particulars of the holotype e.g. 'The holotype of *Hypolamprus venustus* van Eecke, 1929:102; pl.12 fig. 5 is from Sumatra, Fort de

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Screenshot extract from the 'Getting Started' section of the website, showing the structure of a species 'page'.

The site can be found at <http://www.pyralidsofborneo.org/index.php?index>. It is built on a software platform prepared by Oliver Georgi in Germany. Lim Kooi Fong, the owner of Biovis Informatics Sdn Bhd in Kuala Lumpur is using this software under licence to produce a range of websites. This pyraloid one is the prototype for a series of illustrated guide websites cataloguing the biodiversity of Malaysia. These in turn will be the source for downloadable 'AppBooks' to provide research tools for identifying plant and animal groups when out of range of broadband e.g. in the 750K ha Sabah Foundation forest concession of central Sabah, NE Borneo, a major biodiversity hotspot. Typically an 'AppBook' will consist of images of species, names and minimal text, with links to the parent website from which fuller details can be downloaded when in broadband range (available in Malaysian towns and research stations with direct satellite links).

The basic unit of the *pyralidsofborneo* site is a 'page' for each species, with a tab for 'Taxonomy', 'Description', 'Distribution' and more (see image of the screenshot from the 'Getting Started' section of the site). There are empty tabs for such data as DNA barcoding and future uploading of genitalia images. The tabs for 'Distribution & Habitat' and 'Life History & Pest Status' have absolutely minimal content reflecting our minuscule amount of knowledge of these aspects. A major purpose of the site is to provide an opportunity for the PP Collective and others to fill these gaps.

On each 'page' there is a large, magnifiable image of the species, and a thumbnail. A long introduction section covers a range of subjects such as 'Material Examined' and 'LepIndex' (to which there is a hotlink). There is a Checklist and some 800 literature references which are being added to all the time. A Gazetteer covering all the collection sites mentioned on the site will prove useful for all of the South and South-east Asian region.

Special effort has been made to maximise ease of use. For the thyridoids, individual species/morphotype pages can be reached by clicking on the image of the species on one or other of the 10 Plates or you can call up a 'genus gallery' with an image of a fairly typical species of each genus. You can then click on this and get images of all the species in that genus. Further aids are being developed. How we will access the 2,500 pyra-

loids hasn't yet been decided, but we will certainly have the individual species 'pages' and 80+ Plates with 30 or so species imaged on each and the facility to click through to the individual species or morphotype.

The pyraloids to be uploaded will be treated in the same way as the thyridoids already on the site, with one difference. For the thyridoids we were able to include species/morphotypes not found in Borneo but recorded, as it were, from both sides of the island. Due to the large number of pyraloids we will not be able to do this in the next phase of uploading (it will probably take 4 years to upload our existing list of 2500 species/morphotypes). Unless/until significant further funding materialises we are constrained.

Apart from the site being developed by Biovis Informatics for Southdene publishing company for the macro moths of Borneo, we are not aware of other websites for identifying SE Asian moths, or indeed of any site anywhere with the same approach as ours. We hope very much that others will follow and be able to use the same software and design.

Hardly any of the species/morphotypes on our site have been named or imaged on the internet before and are only accessible to the few people with clearance to study

museum collections. Many of the morphotypes are unnamed series set aside by the late Michael Shaffer and Eugene Munroe in the collections of the Natural History Museum in London, as detailed in LepIndex. Their work has contributed heavily to the foundations for this website.

The PP Collective has the expertise and membership size to make major additions to the data we need to 'fill out' this site. Please use the **Feedback form (last Section of the site Menu)** for contributions and thereby make the development of this site a PP Collective activity.

Stephen Sutton, Terry Whitaker & Henry Barlow

News from...

James Hayden

Like weeds, diseases, and giant snakes, pyraloids invade Florida regularly. For example, I have been tracking *Nacoleia "charesalis"* (Walker) (a widespread Palaeotropical species, possibly a complex). It is moving fast: since 2012, it has appeared on the southeast and southwest coasts of Florida, and very recently near Orlando in the state's



A male of the Mexican Rice Borer, Eoreuma loftini (Dyar).

center. Adults fly to sugar bait and foul-smelling Tephritidae traps, and I suspect that the larvae are in stems of banana plants. I depend greatly on the expertise of all my international colleagues to figure out these adventive species.

The most serious introduction, and for me the most time-consuming, is the haimbachiine *Eoreuma loftini* (Dyar), the Mexican Rice Borer. A polyphagous stem-borer in Poaceae, it is probably the worst insect pest of sugarcane in North America, and Florida has the largest cane industry within the U.S. It has been in Texas since 1980, but its appearance in 2012 in north-central Florida surprised me. Survey by FDACS-DPI and University of Florida has delimited the population's extent. Since the larvae are hard to control, I plan for long-term monitoring as it spreads southward. Meanwhile, I struggle with haimbachiine systematics. The North American genera were revised by Capps (1965) and Klots (1970), but they are a sample of a poorly understood global tribe.

The online ID Tool "Microlepidoptera on Solanaceae" was published in September 2013 at <http://idtools.org/id/leps/micro>. Richard Mally and Steve Passoa coauthored the Spilomelinae, most of which are the *Leucinodes* group. As a side-project, Richard Mally and I have worked on a phylogeny of this interesting group.

I have volunteers databasing the pyraloids of the late Dale Habeck. He was a University of Florida professor who raised Lepidoptera from the 1960s through the 1990s. There are many new host records and larval specimens. The long-term plan is to publish summaries of the records for each family group; Drs. Deborah Matthews and Charles Covell have done the Geometridae. Because aquatic weeds are a major problem in Florida, Prof. Habeck's Acentropinae are a major focus.

I continue to make diagnostic dissection slides for the FSCA/MGCL. Time allowing, I want to put photographs of them on line. In the spirit of Pierce and Metcalfe, North America needs more images of pyraloid genitalia to serve regulatory identification and supplement revisionary works. The fauna's large size and incomplete study would obviously require a piecemeal approach, but if regional collections could pool carefully identified slides of important taxa on a site such as the

North American Moth Photographers' Group, we would get somewhere. In the meantime, please ask if you want a photo of anything.

Alma Solis

As of October 1, 2013 I stepped back into my research from being Research Leader for the Systematic Entomology Laboratory. In addition, my colleagues of many years, Mike Pogue and John Brown, retired in 2014. This transition period has been easy and I am located at the National Museum of Natural History in Washington, DC, all the time now, but I have also lost some of my technical support. So Mark Metz and I worked hard to finish some projects, primarily in the genus *Diatraea* and the pyraloid type database of the National Museum of Natural History, Smithsonian Institution. He was able to get many of the genitalia dissections that he did on slides, primarily those of type specimens. I have managed to get some temporary support to continue this with non-type specimens.

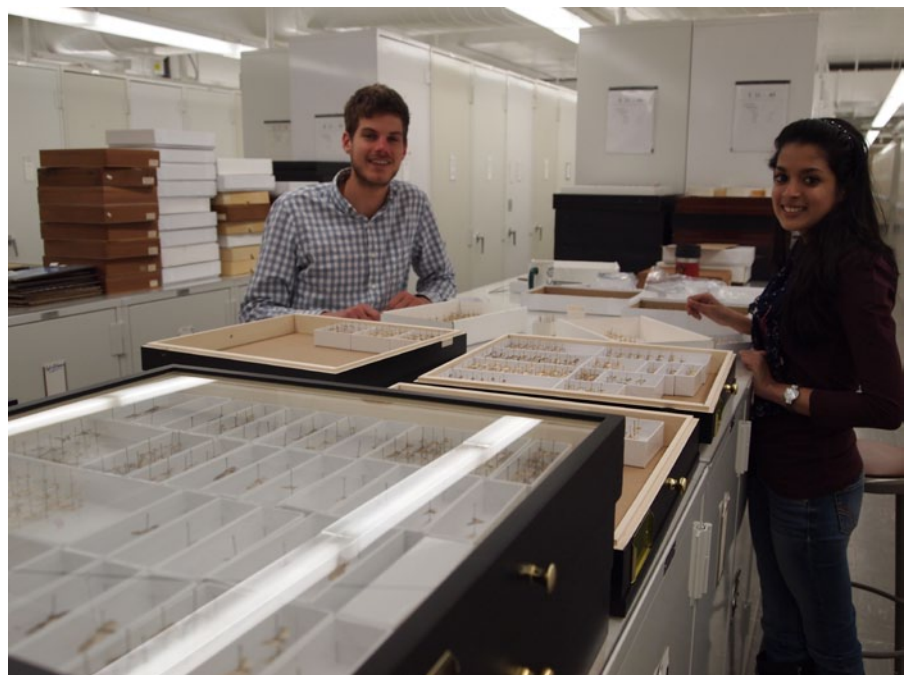
I have been cleaning up my office, returning specimens, and prioritizing projects that need to be finished. The research projects that I am working on this year are pyraloids from Valles Caldera National Preserve, New Mexico, new species of Musotiminae from

southeast Asia feeding on ferns, a new species of *Diatraea* from the U.S., and new morphological keys to the identity of *Diatraea* species. I plan to visit the Natural History Museum in London in August, 2014 to solve some of the problems uncovered during the type pyraloid database project. Unfortunately it is not up on the web yet, but I am more than willing to share type database information with anyone with a research project (just send me an e-mail). I have also been busy working on the writing of my next 5-year project; I will be proposing to finish the Costa Rican pyraloid project with D. Janzen and W. Hallwachs.

Last fall I was invited by Annette Aiello to present two talks at the Smithsonian Tropical Research Institute in Panama entitled "Chasing Snout Moths: A Woman's Quest for Discovery in the Neotropics" in Panama City, and a BAMBI seminar on Barro Colorado Island entitled "Snout Moth Feeding and Habits (Lepidoptera: Pyraloidea)."

In case you missed it, I submitted a blog on sloth moths on the NMNH Department of Entomology Blog fueled by a recent paper by Pauli et al. (2014): http://nsmnh.typepad.com/department_of_entomology/2014/03/sloths-moths-and-algae-whos-eating-whom.html

This past Spring I have also been working on collections, specifically the incorporation



Volunteers Nick Silverson (left) and Alvira Hasan working on incorporating the Ron Leuschner collection into the main USNM Pyraloidea collection.

of the Leuschner donation of over 11,000 pyraloids. I needed to utilize the space for the Pyraloidea of Costa Rica project (we also received the reared material of Janzen and Hallwachs from the Guanacaste Conservation Area in Costa Rica) and I had a number of students available to work on this incorporation. I also worked on material that has been slowly donated by Kelly Richers and Bo Sullivan. My office also had a variety of material that accumulated over the years and needed to be incorporated into the main collection.

Houhun Li

The Fauna of China chapter on Pyralidae, Phycitinae by Houhun Li, Yindang Ren and Hongxia Liu, has been completed with the support of the National Natural Science Foundation of China. A total of 503 species in 116 genera and three tribes are described in detail, including new species, new synonyms, and new combinations. Images of the venation for each genus and of the habitus and genitalia for each species are provided along with distribution maps. The manuscript is now with the editor.

The Wedge Entomological Research Foundation

Ron Hodges, President of the Wedge Entomological Research Foundation, announced the addition of two new members of the Foundation's Board of Directors. Dr. Sangmi Lee and Dr. Todd Gilligan both accepted appointments to the board. The term of each member is 5 years with the option of renewal.

Ron, a founding member, tracks his involvement in the Foundation back to late 1960s. Ron said "What began as a larval organization eclosed into a mature force in the study of moths of the World. Todd and Sangmi will provide continuity for many years to come."

Sangmi Lee was born and raised in South Korea. She started learning about insects when she was a young girl who chased grasshoppers so she could eat their fried legs. Her fascination with moths led her to concentrate on microlepidoptera during her undergraduate program at Kangwon Nat'l

University. As a graduate student of Dr. Kyu-Tek Park, she received her M.Sc. degree with her thesis entitled "Systematics of Subfamily Gelechiinae in Korea." Sangmi received her Ph.D. under Dr. Richard L. Brown at Mississippi State University with her dissertation entitled "Systematics of Holarctic genera of Teleiodini (Lepidoptera: Gelechiidae)."

Sangmi has specialized on Gelechiidae for the past 15 years, and has published 25 scientific papers and 6 non-refereed identification aids on Gelechiidae and other microlepidoptera. She also made many presentations at regional, national, and international meetings. Since 2002 she has curated and identified gelechiids in many collections in North America, becoming one of the foremost experts in this difficult group. Sangmi developed the most comprehensive website on Gelechiidae which includes a global framework for phylogenetics and classification of Gelechioidea. She contributed educational videos on collecting and dissecting microlepidoptera that are available on YouTube. Sangmi is the Collection Manager of the Hasbrouck Insect Collection at Arizona State University, since 2012, and she serves as a referee to the Moth Photographs Group (MPG) site for identifications of gelechiids.

Todd was born and raised in a small town in northern Ohio. He became interested in Lepidoptera at an early age, thanks to his father, who was a high school chemistry teacher. Summers would involve rearing saturniid moths and traveling the state collecting butterflies, moths, and other insects. Todd joined the Ohio Lepidopterists at around age 10, and was very active in that organization for the next 20 years. He began collecting micro moths in the early 1990's during the height of the Ohio Survey of Lepidoptera, and eventually became interested in moths in the family Tortricidae, which remain his specialty. His undergraduate education began at Ohio Northern University and continued at Ohio State University (OSU) where he earned a bachelor's degree in entomology. His original plans to attend graduate school were postponed when his wife moved from Sydney, Australia to Ohio, and he spent the next eight years in the field of computer systems administration. Deciding that studying moths was better than being employed, he left the computer world and returned to OSU to obtain a M.Sc. in entomology. In 2007 he moved with his wife and two dogs to Colorado to pursue a Ph.D. His dissertation

at Colorado State University (CSU) focused primarily on the systematics and identification of economically important tortricids.

Todd currently works as a Research Scientist in the Department of Bioagricultural Sciences and Pest Management at CSU. The majority of his research involves producing morphological and molecular identification resources for invasive Lepidoptera in conjunction with the USDA-APHIS-PPQ-S&T Identification Technology Program (ITP) located in Fort Collins. Todd has authored or coauthored more than 20 peer-reviewed publications, including a book on olethreutine moths. He maintains a website dedicated to tortricids and has performed extensive field work across North America, Europe, Australia, and Africa. He received numerous awards for his entomological work, the most notable including CSU's inaugural University Distinguished Professors Scholarship (2012), the Entomological Society of America's John Henry Comstock Award (2011), and the USDA-APHIS-PPQ Deputy Administrator's Safeguarding Award (2011). Todd currently serves as President of the Lepidopterists' Society, and he is webmaster for the Foundation's website.

Everyone is invited to visit the Foundation's website (<http://www.wedgefoundation.org>). Other board members include: John Brown, Oliver Dominick, Larry Gall, Don Lafontaine, Ron Hodges, Eric Metzler, Jackie Miller, Paul Opler, Kelly Richers, and David Wagner. The Board welcomes communication from all who are interested in the Foundation's activities.

For further information, contact Eric Metzler, metzlere@msu.edu.

Book review

František Slamka 2013. *Pyraloidea (Lepidoptera) of Europe, Volume 3: Pyraustinae & Spilomelinae. Identification - Distribution - Habitat - Biology.* - Bratislava, 357 pp. - ISBN 978-80-969052-8-7.

In his third volume of "Pyraloidea of Europe", published in October 2013, František Slamka focuses on Pyraustinae and Spilomelinae, two of the most diverse groups

among snout moths. This fact is mirrored in the extent of the book: with a total of 357 pages it is by far the most voluminous of the series. As in Volume 2, it is written in English only, therefore reaching a broad readership. The introduction includes a short outline on relevant literature, a list of nomenclatorial changes, illustrated basic terminology of genitalia, a passage on the basic biology of Spilomelinae and Pyraustinae, and a paragraph on the species distribution maps. The distribution maps differentiate between six statuses: 1) confirmed for the country/state, 2) confirmed for the region of country/state, 3) not recently (since 1980) confirmed, 4) occurrence questionable, 5) migrant, 6) introduced. The introduction also contains a short paragraph on DNA analysis for taxonomic and phylogenetic purposes.

The book is well-manufactured: the robust high gloss hardcover encloses the solidly bound pages printed on strong paper. The book's size (17 x 23.6 cm) is the same as in volumes 1 and 2, but it is significantly thicker (3 cm). All illustrations are sharp and clear and the colour plates display the body and right wings of well-set, evenly illuminated adults with naturally appearing colours. The depicted genitalia are well cleaned and of appropriate contrast, and important diagnostic characters, e.g. cornuti in the phallus, are magnified and without the vesica in the background. In the majority of cases multiple adults and genitalia are illustrated for each species, giving the reader an idea of the variability within the respective species. The text part on description, biology and distribution of the species is consistently two-columned as in volumes 1 and 2, with the square distribution maps spanning one column in breadth. All species are consecutively numbered and the illustrations follow the same numbering system, therefore greatly easing the location of the respective adult and genitalia images on the plates. The 110 grey-scale images in the text part, illustrating interspecific differences of closely related species, are numbered consecutively throughout the text, not matching the species numbers, but they are always arranged along with the species under discussion, so their association is straightforward.

Of the 220 species treated in this issue, 98 species in 17 genera are Pyraustinae and 122 species in 34 genera are Spilomelinae. Almost 20% (40 species) of these 220 species are not distributed within the geographi-

cal boundaries of Europe, but are found in North Africa and the Near East. Although information on these species is undoubtedly interesting, their inclusion "because of their similarity to European species" (p. 7) is beyond the scope of this book, impairing its overall consistency and comprehensibility. Besides, other European species have similar non-European species that are not incorporated in the book, so Slamka's selection of non-European species remains unclear. A number of infrequently intercepted tropical or subtropical (pest) species, such as *Glyphodes stolalis* Guenée, 1854, *Maruca vitrata* (Fabricius, 1787), and *Zebronia phenice* (Stoll in Cramer & Stoll, 1782) complement the information on the autochthonous and established fauna of Europe.

Slamka establishes an extensive number of nomenclatorial changes: 40 new synonyms, 7 new or revised statuses, and 8 new generic combinations. Furthermore, he describes 5 species, 3 subspecies, 1 subgenus and 1 genus as new to science. However, only one of the five newly described species, *Udea uralica* Slamka, 2013, is distributed within the European region.

The many problems that still await revision even for the well-studied European fauna become well apparent when looking at *Metasia*: One new subgenus, two new species, one new subspecies, and eleven new synonyms are among the changes established (yet the new subgenus and both new species do not occur in Europe). Apart from the two new species, Slamka mentions four potentially new species in the section "Unplaced *Metasia* spp." on page 121. One may wonder why he didn't describe them as well, because these and the new species *Metasia arenbergeri* and *M. rebeli* are all based on only one single specimen each. In my opinion, a careful, comprehensive revision of this complex genus would have been more useful, instead.

Slamka also describes a new genus of Pyraustinae: *Pseudopagyda* Slamka, 2013. According to Bänziger (1995) the correct generic placement of *homocolorum* Bänziger, 1995, the type species of the new genus, is not clear. Despite the comment that a "comprehensive revision of all related genera is needed to clarify their status" (Bänziger 1995: p. 267) (a comment which Slamka even cites in his book (p. 30)!), he decides to describe the new genus *Pseu-*

dopagyda without investigating the type species of the presumably related genera *Pagyda* Walker, 1859 and *Paliga* Moore, 1886. This is in opposition to the attempts towards nomenclatorial stability, one of the prime objectives of the International Code on Zoological Nomenclature. In addition, Slamka proposes to transfer *Pionea acutangulata* Swinhoe, 1901, *Paliga contractalis* Warren, 1896, and *Botys aureolalis* Lederer, 1863 to *Pseudopagyda* even though Bänziger states that the latter two species "probably each belong to a different genus [than to his proposed combination with *Microstega*]" (Bänziger, 1995: p. 267). Ultimately, most of the 188 valid genus group names of Pyraustinae are in need of revision, and with *Pseudopagyda*, another genus name now needs to be taken into consideration. These kinds of descriptions are of no additional value to the field of systematics.

Altogether, the seemingly random inclusion of non-European species and the inconsequent and non-reflective descriptions of new names make this book unnecessarily inconsistent. Nonetheless, I find it to be a very valuable book for the identification of adults of European spilomelines and pyraustines. It is only just handy enough to be taken along on field trips. The numerous images depicting the variation in the maculation of adults are of great value and the high-quality genitalia illustrations allow identification even of difficult groups through dissection.

Richard Mally

First Red List of German Pyraloidea

In 2012, the first and official Red List of German Pyraloidea was published. Long been neglected from the list of flagship species in nature conservation, Pyraloidea have been the subject of an important increase in knowledge during the last three decades. This holds especially true for Central Europe, where numerous publications are now available for species identification. A growing number of collectors who had traditionally restricted themselves to Macroheterocera and Papilionoidea, also take attention now to these exciting moths.



Ostrinia quadripunctalis (Denis & Schiffmüller, 1775), a congener of the European Corn Borer, is critically endangered in Germany. It is only known from two spots, has been recorded at one of these spots only by the sighting of one moth, and the larval host plant is unknown. Photo: Peter Buchner.

As a result, our knowledge on the frequency of occurrence of species has increased and allowed to prepare the first Red List of German Pyraloidea. The method applied basically requires that one is able to judge the current frequency of occurrence and compare it to long term (about 100 years) and short term (about 20 years) developments. The data were edited and analyzed via an automated spreadsheet, provided by the Federal Agency for Nature Conservation. As a result, 273 pyraloid species are regarded as permanently occurring in Germany, of which 18 species are exotics. Among the 255 autochthonous species, 44.7% are on the Red List, seven of them being extinct and 14 critically endangered. These proportions are more or less similar to proportions known from other groups of organisms. Unfortunately, our knowledge is more limited the rarer the species are. This holds especially true for some of the extinct and critically endangered species. For some of them, we do not even know the larval food plants. In this context, the Red List points to the necessity of research in order to acquire the knowledge needed for the conservation of species. In ten years, the next edition of the Red List will have to be prepared. How much will be achieved until then, in theory as well as in practice? And, will we be able to prepare the next list? The first Red List of German Pyraloidea was made possible by a team of 26 experts across Germany. When the list was published, half of them were already (much) over 60 years old and two

have died since. Certainly, we need more young experts for field work, research, and the conservation of pyraloids.

A pdf of the Red List is available upon request.

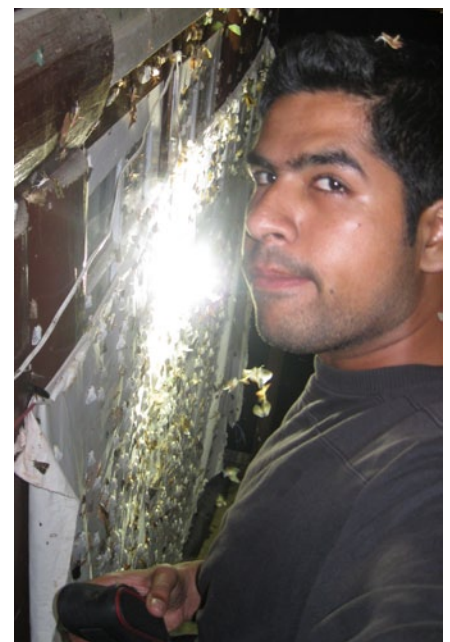
Matthias Nuss

Budding pyraloid specialists

I am doing my doctoral thesis on the taxonomy of Pyraustinae and Spilomelinae of the Western Ghats and North-East India. Through this research initiative I am addressing questions regarding the species composition of both of these biodiversity hot spots. I am focusing on species complexes as I believe that many species are hidden under so-called widespread species. I emphasize biological species (recognized by reproductive isolation) based on genital and other morphological characters. Western Ghats and North-East India are two 'lost worlds', i.e. some of the last, least-explored places on Earth. My PhD supervisor, Prof. (Dr.) Jagbir Singh, Head of the Department of Zoology and Environmental Sciences, did his PhD thesis on Pyraustinae of North-East India. After a gap of three decades my guide and I have

planned systematic collections and studies on the Pyraustinae and Spilomelinae fauna of far flung forests of this vast country. My approach is basic alpha taxonomy, based on wing venation and genitalia. I find Pyraloid Planet a great platform to interact with eminent scholars working throughout the globe; it is a noble interactive initiative for students and teachers as well. With an open heart I welcome critiques and suggestions by fellow scholars, so kindly contact me at dinotide.sym@gmail.com.

Harsimran Singh



Introducing

My name is NAKA Hideshi, an entomologist studying moth sex pheromones, mating behaviour and pest control. I studied mainly female sex pheromones and mating behaviour of Sesiidae species (e.g., Naka et al., 2013).

I started to work on Pyraustinae and Spilomelinae two years ago and to identify the female sex pheromones of some species. Though there are many research papers on the female sex pheromones of Pyraustinae and Spilomelinae species, pheromone lures impregnated with synthetic pheromones cannot attract as many males as virgin females.

Just lately, our research was published in the Journal of Chemical Ecology. *Omphisa anastomosalis* is a serious pest of sweet potato in tropical or subtropical Asia-Pacific regions. Wakamura et al. (2010) already identified the female sex pheromone of this species including a novel compound E10,E14-16:Ald, but the attractiveness of the synthesized pheromone did not effectively attract male moths in the field. My collaborators and myself newly identified Z3,Z6,Z9-23:H as a female sex pheromone component from crude extract of female sex pheromone glands, and the pheromone lure containing this compound and already-reported compounds well attracted male moths (Yan et al., 2014).

Mass rearing by artificial diets

To identify the female sex pheromone of various Pyraustinae and Spilomelinae species, we regularly breed over 15 species using artificial diets prepared from dry leaf powder of their food plants that were quickly dried with silica gel and a widely-used powder for insect artificial diets (Insecta F-II, Nosan Co.).

Unfortunately, we have not succeeded in breeding vitis-feeding species such as *Herpetogramma luctuosale* or *Syllepte pallidinotalis* with artificial diets. However, some closely related species (e.g., *H. submarginale*, which feeds on various Asteraceae) were easily reared with the artificial diet.

Life history and food plants

I aim to provide an exhaustive analysis of the female sex pheromones of Pyraustinae and Spilomelinae species. To this end I have collected female adults and obtained eggs of various species, for which sometimes the food plant was unknown.

For example, the beautiful *Goniorhynchus butyrosus* is common in Japan, but no reports are available on its food plant. I thought that they may feed on Rubiaceae or Caprifoliaceae because the closely related *G. exemplaris* feeds on the Rubiaceae *Paederia scandens*. At first I tried to find the larvae of *G. butyrosus* on various Rubiaceae and Caprifoliaceae, but I failed to find any. One day I obtained two *G. butyrosus* females near my laboratory. When I put a *Paederia scandens* leaf into a cage with the females, they laid many eggs on the leaf. Hatched larvae fed on this plant, and finally I easily obtained many adults. Of course I already identified their female sex pheromone components, and now I prepare some field attraction tests using synthetic pheromones.

Likewise I found food plants of the following species: *Nomis albopedalis*, *Circobotys aurealis* and *C. nycterina* which feed on various woody bamboos, and *Pyrausta unipunctata* on *Isodon trichocarpus*. Besides,

I found *Nacoleia commixta* and *Piletocera sodalis* feeding on various leaf molds or detritus. These species are easily reared with the widely-used artificial diet Insecta LFS (Nosan Co.).

Last September I collected many rolled leaf shelters of *Broussonetia kazinoki* (Moraceae). I expected that *Glyphodes* spp. would emerge from these shelters, but surprisingly, *Syllepte taiwanalis*, which was thought to feed on *Ampelopsis glandulosa*, emerged in the rearing cages.

Portable cases of *Paratalanta pandalis* larvae

Presently I am rearing Japanese *Paratalanta pandalis* (synonym: *Microstega jessica*) with the artificial diets mentioned above using Artemisia and basil leaf powder. Last September I collected a female and it laid many egg clusters. At first I thought that they fed on woody bamboos because a related species, *Demobotys pervulgalis*, feeds on various bamboos. But the emerged caterpillars did not eat bamboo leaves. Finally I found that they feed on various Asteraceae and Lamiaceae. This species is highly interesting in that larvae make portable cases from leaves like bagworm moths (Psychi-



The portable case of the larva of *Paratalanta pandalis* (Hübner, 1825).

dae). Larvae cut off a leaf into a disk, roll it into a tube and close both ends. They never feed on the portable case itself. When larvae are mature, they close the portable case and pupate in it. Recently I realized that UKmoths (<http://ukmoths.org.uk>) already described that the European Bordered Pearl also feed on Lamiaceae and makes a portable case. I would be grateful to know of other portable-case-making Pyraustinae species.

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Male and female of *Paratalanta pandalis* (Hübner, 1825).

Request for identification

Pyralidae larva feeding on green seeds of pongamia pod from India. Photo by M. Shankar Murthy. If you can help to identify the species, please contact S. Murthy.



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