



# THE PYRALOID PLANET

**Volume 13 – December 10, 2019**  
**A Newsletter for Pyraloidea Fans**

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## **Editorial**

It has been a whirlwind year for Pyraloidea and it was a stellar year for Pyraloidea higher-level phylogenetics. Two outstanding papers were published on higher-level phylogeny using morphological and molecular characters. The first, a paper on Spilomelinae and Pyraustinae, by Mally et al., and another by Léger et al. on Crambinae and Scopariinae, significantly advance our knowledge about pyraloid evolution and classification (See **News From** Richard Mally and Theo Léger below).

I also had the opportunity to partially attend Lepidoptera meetings this year, the Societas Europaea Lepidopterologica (SEL) meeting in Italy and the Lepidopterists' Society (LepSoc) Meeting in the United States. I was on vacation in Italy and, unfortunately, missed <sup>1</sup>

the first day of the meeting, the systematics day. Maria Heikkilä said to me the second day: "You were responding on twitter to the talks being given, but I didn't see you at the meeting." I was on the train from Naples to Campobasso and was able to get a twitter's eye view of the presentations. Congratulations to **David Agassiz** and **Ole Karsholt**, both pyraloidologists, who were elected as Honorary Members of SEL.

I am honored to be the incoming President of the Lepidopterists' Society, but I could only attend the Executive Council meeting. I had to be in Ohio the following day to be a Keynote Speaker at "Mothapalooza", where I spoke about, what else, pyraloids! It is a 2-day event for the public with moth talks, workshops, day field trips, and at night, mothing. It was a wonderful experience to visit over 30 moth sheets each night at Shawnee State Park and surrounding areas.

In August I was able to go into The Natural History Museum in London for one day (see **News From** Alma Solis below). I was primarily there for the presentation of the Westwood Medal by the Royal Entomological Society to my husband, Jason Hall, for his monumental, almost 1000-page book on a

tribe of riodinid butterflies. In early November I was honored as a Distinguished Alumnus of the University of Texas at Austin. It was a two-day event, but the highlight to me was my presentation to 100,000 people in the football stadium, where they filmed me on the Jumbotron and announced that I was “an international authority on snout moths!” I am sure the words “snout moths” have never before been uttered on a jumbotron. On this trip I squeezed in three days of field work in Boerne, Texas (see Pyraloid Planet 2018). This past November was late in the collecting season, not many moths came to light, and most were tiny phycitines that I have yet to take off the boards. One night was particularly good at the sheet for moths, and to my delight, Delmar Cain, my host, and I were visited by a tarantula, a six-inch walking stick, and a baby armadillo!

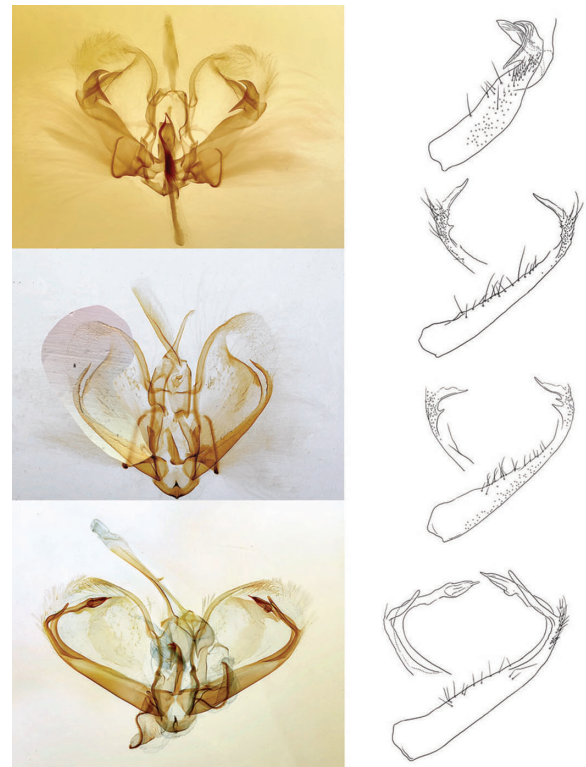
My research last year in this locality was highlighted in a July, 2019 article “The Secret World of Moths” by Sheryl Smith Rodgers in the Texas Parks & Wildlife Magazine. I was told that, in the history of the magazine, it was the first time a photo of a moth was on the cover. Unfortunately, I was not consulted on the cover, so it was not a pyraloid.



Finally, pyraloids continue to be of economic importance worldwide (see **A “Smattering” of Publications**, p.14). *Cydalima perspectalis* (Crambidae: Spilomelinae), the boxwood moth, after spreading westward in Europe, is now going strong in England. I confirmed the presence of the pestiferous *Cactoblastis cactorum* (Pyralidae: Phycitinae), or cactus moth, in Texas for the first time early this past year. I received an email this week from Rob Plowes (UT Austin) that they believe it is now firmly established on the coast of Texas. Also, *Loxomorpha dissimilalis* (Crambidae: Spilomelinae), the cactus webworm, populations are increasing in Mexico and expanding geographically.

Finally, my sincerest thanks to everyone who sent in items for the newsletter.

M. Alma Solis



Variation among male genitalia of *Palpita* species, plate by Taina Litwak, SEL, USDA (Villegas-Lujan et al. 2019)

## GlobIZ News 2019

The Global Information System on Pyraloidea (GlobIZ) is slowly growing with respect to the quantity of taxa. Since the last newsletter, the number of valid species included in the database **increased by 358** (+ 59 synonyms). This increase is primarily due to a systematic check by Richard Mally on Pyralinae. Altogether, there are **25,754 pyraloid names for 2,106 genera** (+ 1,402 synonyms) and **15,955 species** (+ 6,291 synonyms).

The updated table below provides an overview per subfamily. Some described species are still missing in Phycitinae. I very much like to thank all who contributed editing data to GlobIZ.

Matthias Nuss

	Genera		Species	
	Valid	Syns.	Valid	Syns.
<b>Chrysauginae</b>	<b>131</b>	<b>61</b>	<b>399</b>	<b>130</b>
<b>Epipaschiinae</b>	<b>98</b>	<b>69</b>	<b>726</b>	<b>169</b>
<b>Galleriinae</b>	<b>63</b>	<b>61</b>	<b>258</b>	<b>119</b>
<b>Phycitinae</b>	<b>663</b>	<b>381</b>	<b>3146</b>	<b>1477</b>
<b>Pyralinae</b>	<b>135</b>	<b>110</b>	<b>1221</b>	<b>372</b>
<b>Acentropinae</b>	<b>75</b>	<b>39</b>	<b>774</b>	<b>209</b>
<b>Crambinae</b>	<b>175</b>	<b>124</b>	<b>2057</b>	<b>1090</b>
<b>Cybalomiinae</b>	<b>19</b>	<b>15</b>	<b>112</b>	<b>12</b>
<b>Glaphyriinae</b>	<b>54</b>	<b>36</b>	<b>351</b>	<b>165</b>
<b>Heliothelinae</b>	<b>5</b>	<b>6</b>	<b>50</b>	<b>15</b>
<b>Lathrotelinae</b>	<b>5</b>	<b>7</b>	<b>42</b>	<b>8</b>
<b>Linostinae</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>2</b>
<b>Midilinae</b>	<b>13</b>	<b>8</b>	<b>95</b>	<b>16</b>
<b>Musotiminae</b>	<b>23</b>	<b>8</b>	<b>194</b>	<b>25</b>
<b>Odontiinae</b>	<b>88</b>	<b>38</b>	<b>383</b>	<b>141</b>
<b>Pyraustinae</b>	<b>171</b>	<b>104</b>	<b>1229</b>	<b>605</b>
<b>Schoenobiinae</b>	<b>29</b>	<b>17</b>	<b>238</b>	<b>98</b>
<b>Scopariinae</b>	<b>19</b>	<b>24</b>	<b>586</b>	<b>208</b>
<b>Spilomelinae</b>	<b>339</b>	<b>294</b>	<b>4090</b>	<b>1430</b>
<b>Total</b>	<b>2106</b>	<b>1402</b>	<b>15955</b>	<b>6291</b>



*Siamusotima disrupta* Solis, Hong Kong, China  
(Solis et al. 2017)

## Borneo Publishing Project Update November 2019

Volume 1 comprising the Thyridoidea and the Pyraloidea: Pyralidae (sensu Regier et al 2012), was printed and published in September 2015. Copies are still available from Natural History Publications Borneo <https://nhpborneo.com/>.

Volume 2 comprising all the Crambidae subfamilies, including the remarkably species-rich Spilomelinae, from the genus *Aethaloessa* in A-Z order down to *Haritalodes*, is likely to be published early in 2020. Comprising 788 named species or morphospecies at or near the conventional notion of the taxonomic “species level”, Terry Whitaker has slaved for four years to incorporate all the latest systematic and taxonomic published information, including that from mainland China. That is why Volume 2 is now two years behind schedule.

Volume 3 is already largely compiled, except that the genera need a lot more definition. As in Volume 1, the printed Volume 2 will consist of a series of Plates (28 in all) of set



specimens with QR codes linked to the existing website, which will contain virtually all the information about each species. We are in the process of having to switch the method of uploading data to the website for reasons of cost and time. This involves some code-writing. The approach is rather experimental, so there could be delay beyond early 2020 if we don't get it right the first time.

In addition to the plates of set specimens, Volumes 2 & 3 will have around 120 images of adult resting postures of representative species from all the crambid subfamilies.

We expect to sell copies through NHP-Borneo as for Volume 1.

Stephen Sutton

## Lepidoptera Meetings

\*21st **Societas Europaea Lepidopterologica** Congress, Campobasso, Italy, June 3-7, 2019

**Next meeting:** 22nd SEL Congress will be held at the Laulasmaa Spa and Conference Hotel in Laulasmaa, Estonia, end of May or early June, 2021

\*68th Annual Meeting of **Lepidopterists' Society** Meeting, University of California, Davis, CA, United States, July 9-12, 2019 and

\*4th North American Microlepidopterists' Meeting, California Academy of Sciences, San Francisco, CA, United States, July 8

**Next meeting:** 69th Annual Meeting of Lepidopterists' Society Meeting in conjunction with the Southern Lepidopterists, North Carolina, United States, around June 15-20



*Pseudolithosia schausi* Hampson, Mexico,  
Image by C. Grinter, fw length=15 mm

## NEWS FROM.....

### Richard Mally

We hope that our new publication will encourage you, the pyraloid community, to further engage in the research of Pyraustinae and especially the highly diverse Spilomelinae, to revise poorly studied genera and place them into the framework of tribes, and to continue studying the fascinating ecology of these marvellous moths and their caterpillars.

### Recently published

***The phylogenetic systematics of Spilomelinae and Pyraustinae (Lepidoptera: Pyraloidea: Crambidae) inferred from DNA and morphology.*** Mally R., J.E. Hayden, C. Neinhuis, B.H. Jordal and M. Nuss. 2019. *Arthropod Systematics & Phylogeny*. 77(1): 141–204. doi: <https://doi.org/10.26049/ASP77-1-2019-07>  
Download the open-access paper here: [https://www.senckenberg.de/de/07\\_asp\\_77-1\\_mally\\_141-204/](https://www.senckenberg.de/de/07_asp_77-1_mally_141-204/)

In May, we published our comprehensive phylogenetic study on the evolutionary relationships between and among Spilomelinae and Pyraustinae. Based on nucleotide sequences of one mitochondrial and five nuclear genes and on 114 morphological characters from imagines, our results show both Spilomelinae and Pyraustinae to be monophyletic. We find that Spilomelinae can be distinguished from Pyraustinae based on one unique apomorphy: the tympanal organ's fornix tympani are projecting in ventral direction, whereas in Pyraustinae they are recessed within the tympanal frame.

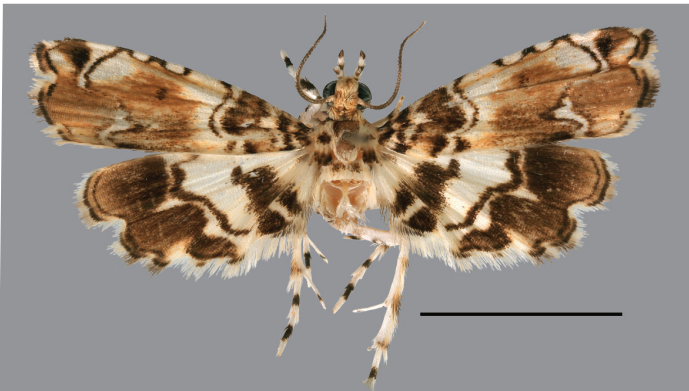
In our phylogenetic results, Spilomelinae are subdivided into 13 monophyletic groups, which we propose as tribes. Based on the morphological synapomorphies of these monophyla, we can associate additional gen-

## Mally con't.

era with them, so about 60% of the 339 spilomeline genera are placed in tribes.

We find an interesting morphological pattern in the four Spilomelinae tribes that are sister to the remainder of the subfamily (the “euspilomeline clades”): members of those four tribes share a number of plesiomorphic characters with Pyraustinae, such as the straight or concave valva costa, the evenly sclerotized phallus apodeme and the Pyraustinae-like “ediacaroid” signum.

*Sufetula*, which Minet (2015) transferred from Spilomelinae to the rehabilitated Lathrotelinae, is clearly not part of spilomelines – instead, we found it to be sister to the “CAMMSS Clade” (*sensu* Regier et al. 2012) minus Musotiminae. Stay tuned for next year for our results on a more precise placement of Lathrotelinae within Pyraloidea!



*Sufetula* n.sp., Costa Rica (USNM)

*Niphopyralis* has been a puzzle in the past. This genus has myrmecophilous larvae living in the nests of Austral-Asian leaf-cutter ants and proboscis-less imagines with a somewhat Bombycoidea-like appearance (see Fig. 1). The genus and its parent subfamily Wurthiinae were included in Spilomelinae by Regier et al. (2012), now forming the tribe Wurthiini with 29 species in six genera.



Fig. 1 Wurthiini: imago of *Niphopyralis* cf. *chionosis*, Mission Beach, Queensland, Australia. © David Fischer

Thanks to the efforts of insect-rearing projects like the ACG project of Dan Janzen, Winnie Hallwachs and their team in Costa Rica, and the CATS project by Scott Miller and his team in Papua New Guinea, we were able to uncover a number of interesting host plant associations among Spilomelinae and Pyraustinae and to put them in a phylogenetic context. For example, Lineodini are exclusively found on Solanaceae, Spilomelini especially on Poaceae, Asciodini on Caryophyllales, and Trichaeini on Rubiaceae. Within Steniini, the larvae of the *Duponchelia* group are found to share a detritivorous lifestyle. Margaroniini, with over 1,000 species in 70 genera and by far largest tribe in Spilomelinae, includes numerous species with larvae feeding on lactiferous plants. Hence, host specificity seems generally rather narrow in spilomeline tribes (see also Segar et al. 2017 on this topic). This will allow focused search for larvae on potential hostplants where only the adults are known.



## Mally con't.

### References:

Janzen D.H. & W. Hallwachs. 2009. Dynamic database for an inventory of the macrocaterpillar fauna, and its food plants and parasitoids, of Area de Conservacion Guanacaste (ACG), northwestern Costa Rica (nn-SRNP-nnnnn voucher codes). URL: <http://janzen.sas.upenn.edu>

Miller S.E., K. Darrow, Y. Basset, G.D. Weiblen, & V. Novotny. 2007. Caterpillars feeding on New Guinea plants - online. URL: <http://www.entu.cas.cz/png/caterpillars>

Minet J. 2015. Lathrotelidae Clarke, 1971: a rehabilitated name deserving subfamily rank (Lepidoptera, Crambidae). *Bulletin de la Société Entomologique de France*. 120(1): 109–112.

Regier J.C., C. Mitter, M.A. Solis, J.E. Hayden, B. Landry, M. Nuss, T.J. Simonsen, S.-H. Yen, A. Zwick, & M.P. Cummings. 2012. A molecular phylogeny for the pyraloid moths (Lepidoptera: Pyraloidea) and its implications for higher-level classification. *Systematic Entomology*. 37: 635–656. doi: <https://doi.org/10.1111/j.1365-3113.2012.00641.x>

Segar S.T., M. Volf, B. Isua, M. Sisol, C.M. Redmond, M.E. Rossati, B. Molem, K. Gewa, C. Dahl, J.D. Holloway, Y. Basset, S.E. Miller, G.D. Weiblen, J.-P. Salminen, & V. Novotny. 2017. Variably hungry caterpillars: predictive models and foliar chemistry suggest how to eat a rainforest. *Proceedings of the Royal Society B: Biological Sciences*, London. 284: 20171803. doi: <https://doi.org/10.1098/rspb.2017.1803>

## Théo Leger

### New position in Berlin

Recently, I was hired as scientific head of the Lepidoptera collection at the Museum für Naturkunde (MfN) in Berlin, Germany (Fig. 1). The position had been occupied by Wolfram Mey who retired after 32 years of service. The MfN offers a large and well-curated collection of Microlepidoptera. The pyraloid collection includes several hundreds of type specimens, among them types from Caradja, Lederer, Möschler, and Ragonot. On the downside, other groups, such as geometrids, noctuids and butterflies, are in great need of curation.

Following the reunification of Germany and the opening of borders, several field trips led by Wolfram to South-East Asia resulted in a massive amount of material which remains to be sorted. Currently, I have three volunteers sorting Spilomelinae and Pyraustinae collected in the Philippines. Their bright patterns make it a relatively easy task for newcomers to the sorting of pyraloids. Therefore, if you are interested in revising a group from this region, please contact me!



Fig. 1. Theo Léger at the Museum für Naturkunde (MfN) in Berlin, Germany

The museum has been granted a massive investment for renovation of the buildings and large-scale digitization of the collections. A digitization station has been created and is displayed as an exhibition, where visitors can see scientists and “digitizers” at work.

## Leger con't

Regarding the Lepidoptera, type specimens will be given priority for digitization. We plan to start digitizing Pyraloidea, as it is one of the best curated groups, and, of course, my group of focus. Another novelty in the MfN is the recently launched “Zentrum für Integrative Biodiversitätsentdeckung” (Center for Integrative Biodiversity Discovery), of which I am a part which aims to find methods and workflows to accelerate biodiversity discovery and species description. Several other young researchers were hired at the MfN, and has created a thrilling atmosphere in the museum. Personally, I feel excited to finally see taxonomy in the limelight!

## Recently published

**Phylogeny, character evolution and tribal classification in Crambinae and Scopariinae (Lepidoptera, Crambidae).** Léger, T., B. Landry and M. Nuss. 2019. *Systematic Entomology*. 44: 757-775. DOI: 10.1111/syen.12353

**Abstract.** Crambinae (2047 spp.) and Scopariinae (577 spp.) are two major groups of pyraloid moths with a worldwide distribution. Their larvae feed predominantly on Poales and Bryophyta, with many cereal crop pests. We present the first molecular phylogeny of the two groups based on five nuclear genes and one mitochondrial gene (total=4713 bp) sampled for 58 crambine species representing 56 genera and all tribes, 33 scopariine species representing 12 genera, and species in several other crambid lineages. Maximum likelihood and Bayesian analyses of the molecular data resolve suprageneric relationships in Crambinae and Scopariinae, whereas relationships between these and other subfamilies remain ambiguous. Crambinae and Scopariinae are each recovered as monophyletic groups, and

Erupini, formerly regarded as an ingroup of Midilinae, is recovered as a possible sister group of Crambinae. The tree topology suggests the following two major changes within Crambinae: Prionapterygini Landry **syn.n.** of Ancylolemiini Ragonot **stat. rev.** and Myelobiini Minet **syn.n.** of Chiloini Heinemann. Argyrini Munroe is monophyletic after the transfer of *Pseudocatharylla* Bleszynski and *Vaxi* Bleszynski to Calamotrophini. Crambini, Diptychophorini, and Haimbachiiini are monophyletic after the exclusion of *Ancylolomia* Hübner, *Euchromius* Guenée, *Micrelephas* Dognin and *Miyakea* Marumo from Crambini, as well as *Microchilo* Okano from Diptychophorini. *Euchromiini* **tribe n.** is described for *Euchromius*. *Microcramboides* Bleszynski **syn.n.** and *Torticulladia* Bleszynski **syn.n.** are synonymized with *Microcrambus* Bleszynski.



*Vaxi critica* Forbes, United States (USNM)

In Scopariinae, *Caradjaina* Leraut **syn.n.** and *Cholius* Guenée **syn.n.** are synonymized with *Scoparia* Haworth, and, in addition, *Dasyscopa* Meyrick **syn.n.**, *Dipleurinodes* Leraut **syn.n.**, and *Eudipleurina* Leraut **syn.n.** are synonymized with *Eudonia* Billberg. *Micraglossa melanoxantha* (Turner) (*Scoparia*) **comb.n.** is proposed as a new combination. We analysed 27 morphological characters of wing venation,

## Léger con't

tympanal organs, male and female genitalia, as well as host plant data and egg-laying behaviour. The ancestral character-state reconstructions confirmed previous apomorphies and highlighted new apomorphies for some of the newly recovered clades. The derived, nonadhesive egg-dropping behaviour is found to have evolved at least twice in Crambinae and is associated with the use of Pooideae as host plants.

## Unravelling species diversity in the South-East Asian genus *Hoploscopa* – in press

Léger T., Kehlmaier C., Vairappan C. S. & M. Nuss . Twenty-six new species of *Hoploscopa* (Lepidoptera, Crambidae) from South-East Asian revealed by morphology and DNA barcoding. Zookeys.

I recently completed the first part of a revision on the genus *Hoploscopa* from South-East Asia. *Hoploscopa* are mid-sized brownish moths with reddish patterns (Fig. 2.) which inhabit montane wet forests from Thailand to the Samoan Islands. These moths resemble the Scopariinae in the shape of their wings and genitalia. They have been placed along with the Heliiothelini in the Scopariinae by several authors (Robinson et al. 1994, Solis & Maes 2002), while others retained them in the Heliiothelinae (Nuss 1998). Our recent phylogenetic analyses (unpublished), however, supports both Heliiothelini and *Hoploscopini* as stand-alone lineages.

Matthias Nuss, a co-author of this study, had planned to conduct this project but later offered it to me as part of my PhD. With only sixteen species described – all, with one exception, were described between the end of 19th and beginning of 20th century – the diversity of this genus was exceedingly under

estimated. Robinson et al. (1994) suggested the occurrence of at least 70 species in the British Museum (NHM, London) awaiting description. Upon the return from our field trip to Borneo (see Pyraloid Planet 2015), the COI barcode of a pyraloid larva found feeding on ferns provided the first host plant record for *Hoploscopa* (Mally et al. 2017). Interestingly, the COI barcode of the larva matched none of the morphospecies we collected there and barcoded, suggesting an even greater species number on Mount Kinabalu.

Comparison with pictures of the type specimens from the NHM (London) revealed all species from Mount Kinabalu to be new. Altogether, eight new species are described from our Kinabalu material in the current paper. Examination of morphology and COI barcodes from museum specimens led to the description of another eighteen species, bringing the number of species in the genus to 41. Interestingly, these moths show a high degree of endemism. The few species with a distribution spanning over several islands show pronounced barcode splits (2 to 5 %) between islands, raising questions about their species status of these island populations. Another thirty species are estimated from the collection of the NMH and will be the scope of a second publication.



Fig. 2 *Hoploscopa* n. sp. Léger & Nuss, scale bar=10 mm



## Leger con't

### References:

- Mally, R., T. Léger, C.S. Vairappan, S. Sutton, & M. Nuss. 2017. Discovery of another fern-feeding group of moths: the larvae of Hoploscopini (Insecta: Lepidoptera: Pyraloidea) from Borneo. *Raffles Bulletin of Zoology*. 65: 100–108.
- Nuss, M. 1998. The Scopariinae and Heliiothelinae stat. rev. (Lepidoptera: Pyraloidea, Crambidae) of the Oriental Region - a revisional synopsis with descriptions of new species from the Philippines and Sumatra. *Nachrichten des entomologischen Vereins Apollo Supplement*. 17: 475–528.
- Robinson, G. S., K. R. Tuck, & M Shaffer. 1994. A field guide to the smaller moths of South-East Asia. Natural History Museum, London.
- Solis, M.A. and K.V.N. Maes. 2002. Preliminary phylogenetic analysis of the subfamilies of Crambidae (Pyraloidea: Lepidoptera). *Belgian Journal of Entomology*. 4: 53–95.

## Bernard Landry

### The primary types of Pyraloidea in the Muséum d'histoire naturelle, Geneva, Switzerland

I have now completed a catalogue of 437 Lepidoptera primary types (holotypes, lectotypes, and syntypes) found in the Muséum d'histoire naturelle, Geneva, Switzerland (MHNG); available on-line at DOI: 10.5281/zenodo.2784458.

Our museum has 82 Pyraloidea primary types (Figs. 1-2), all of them holotypes, and it is the second largest represented taxon after Noctuidae. These 82 holotypes belong to 11 subfamilies of Pyraloidea, i.e. Phycitinae, represented by 35 holotypes, Crambinae, with 22, Spilomelinae, 9, Pyralinae, 6, Epipaschiinae, Pyraustinae and Schoenobiinae (2 each), and Acentropinae, Glaphyriinae, Musotiminae and Odontiinae (1 each). Among the 67 authors of 437 Lepidoptera taxa described with primary types in the MHNG, Joseph de

Joannis is the best represented with 56 taxa, all of which are Pyraloidea. Thus, de Joannis described 68% of the taxa represented by types of Pyraloidea in the MHNG. All were described from Mozambique in his famous 1927 paper [Joannis, J. de 1927. *Pyralidae d'Afrique australe*. *Bulletin de la Société lépidoptérologique de Genève* 5, 181–256.]. Graziano Bassi and I, *ex aequo*, are in second place among pyraloid taxonomists with holotypes deposited in the MHNG. Graziano Bassi has deposited type specimens of 11 African Crambinae and I have deposited 11 Neotropical taxa in Spilomelinae (6), Crambinae (2), and Glaphyriinae, Musotiminae and Pyraustinae (1 each). Overall, 84% of the Pyraloidea holotypes in the MHNG are from the Afrotropical region, 13% are Neotropical, and 0.2% (2 subspecies types) are Palearctic.



Fig. 1. Holotype of *Angustalis besucheti* (Bleszynski, 1963)(MHNG).

Although the MHNG will be 200 years old in 2020, its holdings of type specimens of very old taxa of Lepidoptera is minimal. The oldest type specimen is from A. Guenée in 1872 of a Neotropical nymphalid species.

## Landry con't

Among Pyraloidea, the oldest type specimens were described by J. de Joannis (1927) and collected in Mozambique between 1906 and 1908. A catalogue of an active scientific collection is an on-going process, and as such, four holotypes of Pyraloidea have been added to the MHNG holdings since the publication of our catalogue last May. All the MHNG Lepidoptera primary types are now databased and we have begun to photograph them, with the goal of displaying the information on the internet. For more information on the MHNG specimens, please don't hesitate to contact me.



Fig. 2. Holotype of *Hypsopygia audeoudi* (Joannis, 1927) (MHNG).

## Guillaume Leraut

I am announcing the soon-to-released second issue of the *Revue Française d'Entomologie Générale* (<https://www.revue-rfeg-entomologie.fr>). In issue 1, I described a very unusual genus, *Balinskyia*, of Pyralidae, Phycitinae, with a new species from Madagascar.

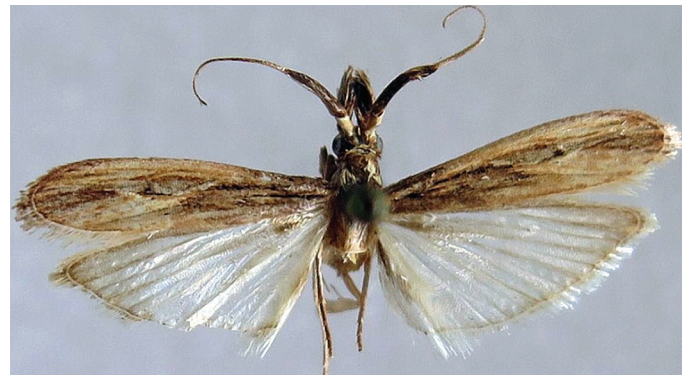


Fig. 1. *Balinskyia apidis* G. Leraut adult habitus.



Fig. 2. *Balinskyia apidis* head. The black line indicates the vestigial 3rd segment of labial palps.

## Chris Grinter

I was hired as Collection Manager at the California Academy of Sciences in San Francisco (Fig.1) three years ago and have been hard at work re-invigorating the Lepidoptera collections. With help from David Bettman and lots of volunteers, we have re-curated the Pyraloidea (as well as all other microlepidoptera families).

The pyraloid collection is small, but global in scope with just under 1,000 species and 19,000 specimens. I look forward to pro-



## Grinter con't

cessing our large backlog, as well as growing the Lepidoptera collection into the ~6,000 empty drawer spaces I have available for use.

In the small amounts of free time I have available, I am working on a long-delayed revision of *Hemiplatytes* (with special thanks to my collaborator Bernard Landry for his patience!). An updated inventory of the pyraloid collection can be found here: <https://monarch.calacademy.org/collections/listtable-display.php?taxa=Pyralidae;Crambidae>



Fig. 1. Chris Grinter at the California Academy of Sciences

## Willy and Jurate De Prins

### Afromoths website updated

Afrotropical Lepidoptera lovers always look forward to new updates of the Afromoths website. On 1st October 2019 Jurate and I sent our latest version of the Afromoths database to Nicolas Noé, the website programmer who checks the database carefully for possible errors or omissions and then releases the new

update. This latest autumn release was done on 14 October, almost simultaneous with the date of Nicolas' resignation at GBIF. This will, of course, not be the end of the Afromoths website. Fortunately, there will be a successor for Nicolas before the end of 2019. We thank him immensely for the job he has accomplished during the past years with the Afromoths website and wish him success in his new job.

The Afromoths database has grown during the past months with much additional information on several families, especially Lecithoceridae, Erebidae and Noctuidae, and many photos, mainly of type specimens, have been added for a total of over 30,000. There were some additional photographs of the Crambidae and Pyralidae as well, particularly from the Paris museum (Figs. 1 and 2).



Fig. 1. *Analyta gammalis* Viette, 1958 (Crambidae: Spilomelinae), Holotype, East Madagascar, Ifanadiana District, near Ranomafana, 700 m, 29.iii.1955, leg. P. Viette and its genitalia dissected by J. C. Shaffer, preparation nr 2160, MNHN. [[http://www.afromoths.net/species\\_by\\_code/ANALGAMM](http://www.afromoths.net/species_by_code/ANALGAMM)].

We invite you to have a look at <http://www.afromoths.net/species/pictures> and then filter either on Crambidae or Pyralidae. If you could help us with more pictures, preferably of type specimens, we would be most



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grateful. Also, photographs of non-types or of specimens in nature are welcome (Fig. 3). Please send your photos to [willy.deprins@gmail.com](mailto:willy.deprins@gmail.com).



Fig. 2. *Lophocera vadonalis* Marion & Viette, 1956 (Pyrilidae: Pyralinae), Holotype, North-East Madagascar, near Maroantsetra, Ambodi-voangy Forest, 23–27.iii.1952, leg. P. Viette and its genitalia dissected by P. Viette, preparation nr 3532, MNHN. [[http://www.afromoths.net/species\\_by\\_code/LOPHVADO](http://www.afromoths.net/species_by_code/LOPHVADO)].



Fig. 3. Left: *Agathodes musivalis* Guenée, 1854 (Crambidae: Spilomelinae), Democratic Republic of the Congo, Katanga, Frontier mine, near Sakania, 16.xii.2014, photo N. Voaden; Right: *Cirrhochrista muelleralis* Legrand, 1957 (Crambidae: Spilomelinae), Seychelles, La Digue, Calou Guesthouse, 12.viii.2009, photo P. Mazzei. [[http://www.afromoths.net/species\\_by\\_code/AGATMUSI](http://www.afromoths.net/species_by_code/AGATMUSI) – [http://www.afromoths.net/species\\_by\\_code/CIRRMULL](http://www.afromoths.net/species_by_code/CIRRMULL)].

## Alma Solis

My chapter on aquatic and semi-aquatic Lepidoptera in the 5th edition of the book “Introduction to Aquatic Insects in North America” was published (Solis 2019). There were two multi-authored papers on spilomelinae: on *Palpita quadristigmalis* as a pest of Japanese privet in Mexico (see image on page 2, & Villegas-Luján et al. 2019) and *Loxomorpha flavidissimalis* (González-Hernández et al. 2019), on cactus. Another paper (Solis et al. 2019) about a new species of *Sufetula* (Lathrotelinae) feeding on the roots of pineapple in Costa Rica was a collaborative effort by professionals in various government agencies, including Jim Hayden, and private companies in Costa Rica and the United States.

This year I finished a revision of *Asturodes* (Spilomelinae), beautiful yellow moths with brown and silver scales from the Neotropics. Three species were reared on Rhamnaceae by Daniel Janzen, Winnie Hallwachs, and “gusaneros” or parataxonomists at the Guanacaste Conservation Area (ACG) of Costa Rica. Mike Pogue and I collected a new species of *Asturodes* during our 3-month trip to Paraguay in the 80’s. It is now in press with another paper on a new species of *Eoreuma* (Crambinae), whose larvae were found feeding on sugarcane in Colombia. I was truly surprised (or forgotten) that only three species of *Eoreuma* had been previously described from South America. I also completed a paper about *Archernis humilis* (Spilomelinae) from southeast Asia with Richard Mally and the Pratt biological control laboratory that developed a colony and did host plant preference tests. Most specimens in museums were collected in the 19th century.

In August I was able to go to The NHM (London) for one day to compare genitalia

dissections with figures in Capps (1967) of Neotropical *Hahncappsia* (Pyraustinae) for a paper on new species from the ACG in Costa Rica.

With year-end funds this year I hired a contractor to label the Spilomelinae material from the ACG in Costa Rica. Jenny Phillips from Costa Rica spent 2 weeks in our museum so we could work on Acentropinae manuscripts again. Finally, this week Jessica Bird, who has been working to upload into EMU the NMNH Pyraloidea type catalog that I completed a number of years ago, told me that she has commenced uploading to EMU about 5000 images.

References:

Capps, H.W. 1967. Review of some species of *Loxostege* Huebner and descriptions of new species (Lepidoptera: Pyraustidae: Pyraustinae). Proceedings of the United States National Museum. 120 (3561): 1-75.

Solis, M.A. 2019. Aquatic and semiaquatic Lepidoptera, pp.765-789 In: Introduction to Aquatic Insects of North America, R. W. Merritt, K.W. Cummins, and M.B. Berg (Eds.). 5th edition, Kendall/Hunt Publishing Company, Dubuque, Iowa. 1480 pp.

Solis, M.A., J. E. Hayden, F. Vargas Sanabria, F. Gonzalez, C. Sanabria Ujueta, & C.J. Gulbranson. 2019. A new pyraloid moth species of *Sufetula* Walker (Crambidae) feeding on the roots of pineapple, *Ananas comosus* (L.) (Bromeliaceae), from Costa Rica. Proceedings of the Entomological Society of Washington 121(3): 497-510. <https://doi.org/10.4289/0013-8797.121.3.497>

Villegas-Luján, R., M. Felipe-Victoriano, K. Keegan, M. A. Solis, & S. R. Sánchez-Peña. 2019. Identity and first report of the four-spotted moth, *Palpita quadristigmalis* (Lepidoptera: Crambidae), as a pest of Japanese privet, *Ligustrum japonicum* Thunb. (Oleaceae) in Mexico. Proceedings of the Entomological Society of Washington. 121(2): 290-298.



*Eoreuma* n. sp. larva on sugarcane, Colombia, image by P.A. Osorio Mejia

## FROM THE WEB...

Steve Passoa reports that he is a co-author on a recent book: Marquis, Robert J.; Passoa, Steven C.; Lill, John T.; Whitfield, James B.; Le Corff, Josiane; Forkner, Rebecca E.; Passoa, Valerie A. 2019. **Illustrated guide to the immature Lepidoptera on oaks in Missouri**. FHAAS-2018-05. Morgantown, WV: U.S. Department of Agriculture, Forest Service, Forest Health Assessment and Applied Sciences Team. 369 p.

There is a small Pyralidae section of 5 species in the Phycitinae and Epipaschiinae. You can view this publication for free and download a PDF version by clicking on this link: [https://www.fs.fed.us/foresthealth/technology/pdfs/FHAAS-2018-05\\_Immature\\_Lepidoptera\\_Oaks.pdf](https://www.fs.fed.us/foresthealth/technology/pdfs/FHAAS-2018-05_Immature_Lepidoptera_Oaks.pdf)

## FROM THE TWITTERSPHERE...

Ian McMillan @icmcmi often posts images of pyraloids from Australia. See example below.





## Finally.....

### A “Smattering” of Publications

There were many taxonomic papers about the Pyraloidea worldwide, particularly China and Europe, so many that I could not list them all. Below are some selected papers about other miscellaneous topics.

**Pyraloidea of Europe**, volume 4/Phycitinae Part 1 by František Slamka, 2019, 100 Euros, 16.8 x 23.5 cm, 432 pp, Hardcover, 175 B&W plates (>600 photographs of males and females), 31 color plates (900 images).

This volume is comprised of short descriptions and illustrations of 207 species of the subfamily Phycitinae (Cryptoblabini and a part of Phycitini) occurring in Europe and adjacent countries, and a few species from

Afghanistan and China. Brief information on the imago, habitat, and biology are given with notes on similar species, distributional maps, and genitalia for almost all species. Many taxonomic changes are introduced, including new synonyms and new species (16) and genera (12) are described.

**On *Cydalima perspectalis*** (only locality from title given):

Agius, J. 2018. Maltese Islands. SHILAP. 46: 577-579.

Badano, D., D. Caracciolo, M. Mariotti, & V. Raineri. 2019. Liguria (North-West Italy) (SHILAP Revta. Lepid. 47(185): 87-95. [Images of the caterpillar and its damage]

Eitschberger, U. 2018. München (Lepidoptera: Crambidae). Neue Entomologische Nachrichten 75: 161-166.

Gómez-Undiano, I., P. Martínez-Ovejero, S. Villegas, N. Prieto, A. Herrero, & A. Vives Moreno. 2018. Madrid, Spain (Lepidoptera: Crambidae, Spilomelinae). SHILAP. 46: 585-591.

Plant, C. W., C. Poole, A. Salisbury, & S. Bird. 2019. Britain. Entomologist's Record & Journal of Variation. 131: 122-147.

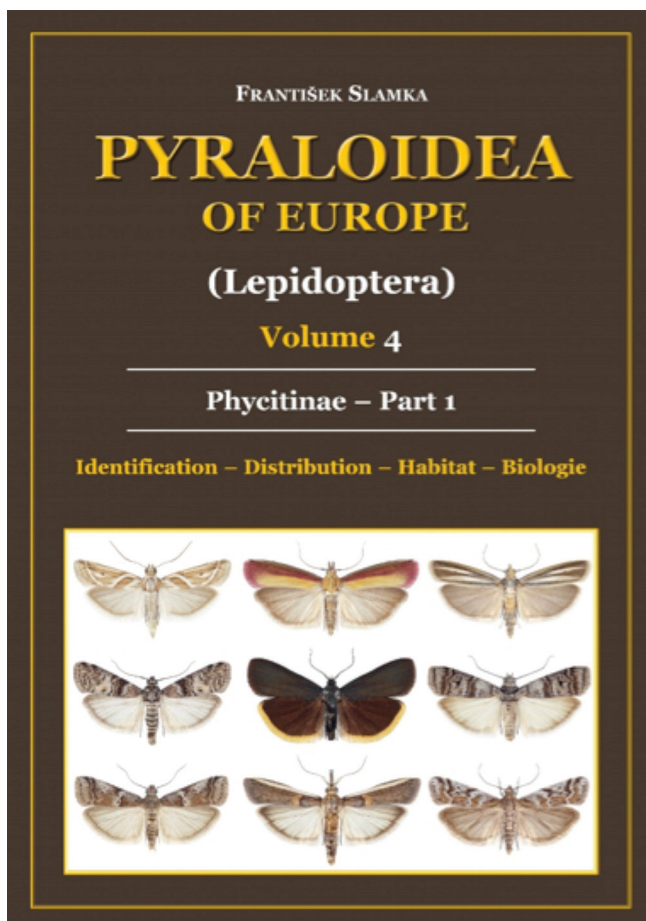
**On Cactus-feeding pyraloids** (only taxon from title given):

Folgrait, P. J., G. A. Montenegro, R. M. Plowes, & L. Gilbert. 2018. *Cactoblastis cactorum*. Florida Entomologist. 101: 559-572

González-Hernández, Á., V. López-Martínez, M. A. Solís, D. Guillén-Sánchez, & A. Burgos-Solorio. *Loxomorpha flavidissimalis*. Florida Entomologist. 102(3):638-641, <https://doi.org/10.1653/024.102.0329>

**Using barcodes for species delineation**

Tams, T. J. 2018. The correct name for the Tyneside *Vitula* (Lep: Pyralidae). The En-





tomologists' Record and Journal of Variation. 130: 324-327. [*V. serratilineella* occurs in Europe, not *V. edmandsii*].

Sexton, C. 2019. Clarification of the status of *Petrophila jaliscalis* and *Petrophila santafealis* (Lepidoptera: Crambidae) in North America. Southern Lepidopterists' News. 41(3):216-225.

### Morphology

Zhang, Y.-J., D.-Y. Chen, X.-T. Chao, Z.-S. Dong, Z.-Y. Huang, X.-L. Zheng, & W. Lu. 2019. Morphological characterization and distribution of antennal sensilla of *Diaphania angustalis* Snellen (Lepidoptera: Crambidae). Microscopy Research & Technique. 2019: 1-10. DOI: 10.1002/jemt.23329

### Biology/Hosts

Heckford, R. J. & R. Leverton. 2018. *Catoptria permutatellus* (Herrich-Schäffer, 1848) (Lepidoptera: Crambidae) successfully reared from the egg for the first time. Entomologist's Gazette. 69: 223-238. [images of all stages]

Kallekkattil, S., A. Krishnamoorthy, & M. G. Venkatesha. 2019. Biology and seasonal incidence of the jack shoot and fruit borer, *Diaphania caesalis* (Walker) (Lepidoptera: Crambidae). International Journal of Tropical Insect Science. <https://doi.org/10.1007/s42690-019-00033-6>

Meert, R. 2019. Feeding behavior of *Ecopisa effractella* larvae (Lepidoptera: Pyralidae). Phegea. 47(1): 16-20. [Phycitinae]. [images of the different moth stages and webs]

Nakano, R. & K. Nagamine. 2019. Loudness-duration tradeoff in ultrasonic courtship songs of moths. Frontiers in Ecology and Evolution. 7 (Article no. 244): doi: 10.3389/fevo.2019.00244 [17 Pyraloidea species were studied].

Pabis, K. 2018. What is a moth doing

under water? Ecology of aquatic and semi-aquatic Lepidoptera. Knowledge and Management of Aquatic Ecosystems. No. 419 (article no. 42) <https://doi.org/10.1051/kmae/2018030>

Quicke, D., W. S. Kuslitzky, & B. A. Butcher. 2018. First host record for Old World *Yelicones* (Hymenoptera: Braconidae: Rogadinae) adds to evidence that they are strictly parasitoids of Pyralidae. Israel Journal of Entomology. 48(1): 33-40. [Reports *Y. iranus* as a parasitoid of *Phycita diaphana* in Israel, the first host record outside of the Americas; review the records of all known pyralid hosts including other phycitines and epipaschiines. Images of caterpillar and its host leaf and the wasp's mummified host or caterpillar.]

Suetsugu, K. & Y. Yoshiyasu. 2019. Infestation of the non-photosynthetic plant *Mitrastemon yamamotoi* (Ericales: Mitrastemonaceae) by *Assara balanophorae* (Lepidoptera: Pyralidae). Entomologica Science: doi: 10.1111/ens.12372 [Phycitinae; brood-site pollination mutualism]

Vanegas-Rico, J.M., J. R. Lomeli-Flores, E. Rodríguez-Leyva, J. M. Valdez Carrasco, & A. Luna-Cruz. 2018. First record of *Laetilia coccidivora* (Lepidoptera: Pyralidae) as predator of *Diaspis echinocacti* (Hemiptera: Diaspididae) in Tlalnepantla, Morelos. Dugesiana. 25(2): 125-127. [Mexico; in Spanish].

### Surveys/Distributions

Bengtsson, B. Ä. 2019. Remarkable records of Microlepidoptera in Sweden during 2018. Entomologisk Tidskrift 140(1): 1-18.

Choi, S.-S. & S.-S. Kim. 2019. Six new records of Crambidae (Lepidoptera) from Korea. Journal of Asia-Pacific Biodiversity. doi: [10.1016/j.japb.2019.03.009](https://doi.org/10.1016/j.japb.2019.03.009) [Six Crambidae, *Herpetogramma pseudomagnum*, *Tatobotys biannulalis*, *Metoeca foedalis*, *Elophila*

*nigrolinealis*, *Crocidolomia pavonana*, and *Evergestis pallidata*, for the first time from Korea. Diagnoses, distribution, pictures of adults, and genitalia of both sexes are provided.]

Davis, A.M. & G. M. Tordoff. 2018. Microlepidoptera Review of 2017. The Entomologists' Record and Journal of Variation. 130: 281-306. [Includes Pyralidae and Crambidae. In the Introduction they make comments specific to *Elophila rivulalis*, *Hypsipyra grandella*, *Euzophera costivittella*, *Ephestia woodiella*, *Cydalima perspectalis*, and *Etiella zinckenella*]

Gruwier, C. 2019. Contribution to the study of moths (Lepidoptera) in a private garden, in an urban area, in Mouscron (Hainaut Province, Belgium) from 2007 to 2016. Phegea. 47(1):3-10. [28 Crambidae; 23 Pyralidae; photos of adult moths and locality]

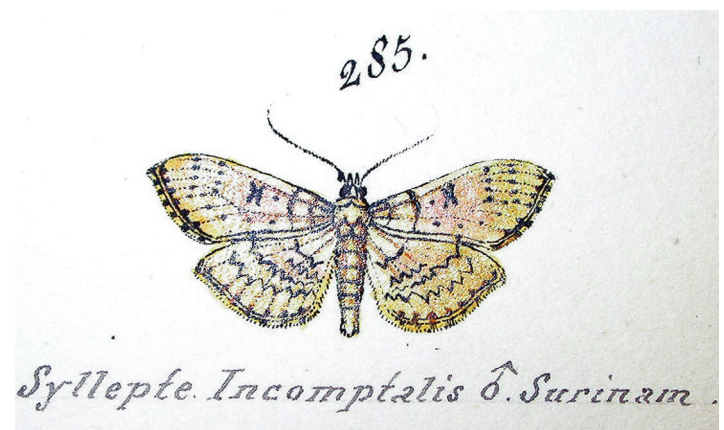
Hoare, R. J. B. & N. Hudson. 2018. Adventive moths (Lepidoptera) established in mainland New Zealand: additions and new identifications since 2001. The Australian Entomologist. 45: 273-324. [includes 4 crambids, 2 pyralids]

Falck, P., O. Karsholt, & F. Slamka. 2019. New data on Pyraloidea from the Canary Islands, Spain (Lepidoptera: Pyraloidea). SHILAP Revta. Lepid. 47(185): 33-48. [21 species of Pyraloidea new to the Canary Islands (Spain). Photographs of adults of all species are shown. Photographs of the genitalia are either shown or references are given to literature where they are figured. The occurrence of *Aglossa pinguinalis* and *Synclera traducalis* in the Canary Islands is questioned.]

Poltavsky, A. N., S. Sáfián, G. Simonics, V. D. Kravchenko, & G. C. Müller. 2019. The Pyraloidea (Lepidoptera) fauna in the Liberian Nimba Mountains, West Africa, at the end of the dry season. Israel Journal of Entomology. 49(1): 11-40. [106 species in 2017]

Perez, C. E., R. M. Gillem, & M. R. Honey. 2018. *Agathodes designalis* (Guenée) from Gibraltar—an adventive species new to Europe (Lepidoptera: Crambidae, Spilomelinae). SHILAP Revista Lepidoptera 46(184): 615-617.

Seven, E. 2019. First comprehensive faunistic list on the Lepidoptera species of Batman Province (Southeastern Turkey). MUNIS Entomology & Zoology. 14(2): 439-447. [18 newly recorded species of Pyraloidea for this province in the southeast of Turkey]



From: Hübner, J. 1819–1823 [imprint “1823”]: Zuträge zur Sammlung exotischer Schmetterlinge [sic], bestehend in Bekundigung einzelner Fliegmuster neuer oder rarer nichteuropäischer Gattungen. – Augsburg.

## Pyraloid Enthusiasts

Please welcome **Vernon Brou, Frantisek Slamka, Yusuke Sakamoto, Chuck Sexton, and Yutake Yoshiyasu** to this list from Australia

Refer or forward the details to me about anyone who wishes to be put on the Pyraloid Planet distribution list.

Reminder: I send a request in early Fall (around late September) for contributions. If you have any suggestions, comments, and, more importantly, additions for next year's edition, including photographs (as attachments) of our favorite pyraloid moths, please send to me ASAP or during the year, so you don't forget. The next deadline will be October/November 2020.

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