

# SEL News Lepidoptera

The Newsletter of the Societas Europaea Lepidopterologica

Volume 60 – February 2018



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 Reinhard Gaedike, Matthias Nuss, Axel Steiner & Robert Trusch (Hrsg.)  
 unter Mitarbeit zahlreicher Lepidopterologen

ENTOMOFAUNA GERMANICA • Band 3  
 Entomologische Nachrichten und Berichte (Dresden) Beiheft 21

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Armin Dett

**Moths**  
 of Costa Rica's Rainforest

- Aldidae
- Limacodidae (Slug moths)
- Megalopygidae (Flannel moths)
- Hedyidae (American moth-butterflies)
- Thyrididae (Picture-winged leaf moths)
- Depressariidae (Twirler moths and kin)
- Crambidae (Crambid snout moths)
- Pyralidae (Pyralid moths)
- Mimallonidae (Sack bearer moths)
- Lasiocampidae (Lappet moths)
- Apantelesidae (American silkworm moths)
- Bombycidae (Silkworm moths)
- Saturniidae (Saturniid moths)
- Sphingidae (Hawkmoths)
- Geometridae (Geometrid moths)
- Sematuridae (American swallowtail moths)
- Uranidae (Sunset moths)





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## A kind reminder: please pay your membership fee

Dear SEL members,

Please check whether you have transferred your membership fee for 2018 and previous years:

Ordinary member: 50€

Corporate member: 65€

The membership fee is due on January 1 of every year. Please transfer your (yet missing) membership fee to the account below. Alternatively you may also pay the amount to your local treasurer (see page 26). Thank you! A letter with membership card and payment reminder will be sent to all members in February 2018. If your address has changed, please inform the Membership Secretary Hossein Rajaei (hossein.rajaei@smns-bw.de).



## Rappel pour les paiements

Chers membres de la SEL,

Merci de vérifier que vous avez bien payé votre cotisation pour 2018 et les années précédentes.

Membres ordinaires: 50€

Institutions et entreprises: 65€

La cotisation annuelle est due à compter du 1er janvier. Merci d'opérer le transfert bancaire de votre cotisation 2017 (et éventuellement celles des années précédentes) au compte bancaire ci-dessous. Vous pouvez aussi payer à votre trésorier national, dont la liste est à la page 26 de SELepidoptera News. En Février 2018, une lettre sera envoyée à chaque membre pour leur adresser leur carte de la SEL et leur demander de payer au plus vite la cotisation pour 2018. Merci d'informer Hossein Rajaei, le secrétaire aux membres, de votre nouvelle adresse, si elle a changée (hossein.rajaei@smns-bw.de).



## Zur Erinnerung: Bitte zahlen Sie Ihren Mitgliedsbeitrag

Liebes SEL-Mitglied,

bitte prüfen Sie, ob Sie Ihren Mitgliedsbeitrag für 2018 und die vorangegangenen Jahre bezahlt haben.

Einfache Mitglieder: 50€

Institutionelle Mitglieder: 65€

Ihr SEL-Mitgliedsbeitrag wird immer zum 1. Januar eines jeden Jahres fällig. Bitte überweisen Sie Ihren (ggf. noch ausstehenden) Betrag auf das unten stehende Bankkonto. Alternativ können Sie den Betrag auch an Ihren SEL-Schatzmeister vor Ort (siehe Seite 26) bezahlen. Vielen Dank im Voraus! Ein Brief mit Mitgliedskarte und Zahlungserinnerung wird im Februar 2018 an alle Mitglieder versendet. Falls sich Ihre Adresse geändert haben sollte, wenden Sie sich bitte an den SEL-Mitgliedersekretär Hossein Rajaei (hossein.rajaei@smns-bw.de).

**Bank: Postbank Köln**

**IBAN: DE63 3701 0050 0195 6505 07**

**BIC: PBNKDEFF**

# Changes to the list of members – Changements à la liste des membres – Änderungen zur Mitgliederliste



*Hossein Rajaei, SEL membership secretary; hossein.rajaei@smns-bw.de*

## Abbreviations – abréviations – Abkürzungen

SI: special interests – Interesses – intérêts

## New members – Nouveaux membres – Neue Mitglieder

### Holzhaue, Chantal

Stuttgart, Germany  
EM: holzhauechantal@web.de  
SI: Geometridae

## Changes in email addresses – Changements d'adresses e-mail – Geänderte E-Mail-Adressen

Aalto, Antti Viktor  
anaaalto@gmail.com

Baron, Thomas  
now living in Germany,  
thomas.r.baron@gmail.com

Charmeux, Jean-Francois  
jf.charmeux@sfr.fr

Danchenko, Alexander  
alex.danchenko@gmail.com

Franz, Raimund  
raifranz@chello.at

Franzen, Markus  
markus.franzen@lnu.se

Koren, Toni  
now living in Croatia,  
koren.toni1@gmail.com

Shaw, Mark  
markshaw1945@gmail.com

## Deceased – Décédé – Verstorben

van Oorschot, Harry (September 28, 2017)

Cox, Anton (May 5, 2016)

Kurz, Marion Elisabeth (November 20, 2017)

## Resignations – Radiation – Austritte

Hill, Leslie John (UK)  
Kinoshita, Soichiro (Japan)  
Tshikolovets, Vadim (Czech Republic)  
Weisert, Friedrich (Austria)  
Zubek, Anna (Poland)

## Deleted members – Membres radiés – Gelöschte Mitglieder\*

BIOSIS (Information Authority Department) (U.S.A.)  
Behzadi, Mohammad Reza (Iran)  
Belik, Alexei G. (Russia)  
Bidychak, Roman (Ukraine)  
Hauenstein, Werner (Switzerland)  
Laiho, Juha (Finland)  
McNamara, Donald S. K. (UK)  
Park, Kyu-Tek (South Korea)  
Réal, Pierre J. G. (France)  
Rymen, René (Belgium)  
Summers, Glenn Brian (France)

\*exclusion from SEL after being in arrears with payment of fee for more than two years – la radiation de la SEL est automatique au bout de deux années civiles sans paiement de la cotisation statutaire – Ausschluss aus der SEL wegen Zahlungsrückständen über mehr als zwei Jahre

▪



# Partial Council Meeting in Frankfurt 2017

*Erik van Nieuwerkerken, SEL president*

On September 19 and 20 president Erik van Nieuwerkerken visited Wolfgang Eckweiler in Frankfurt, in order to make Wolfgang's position as SEL treasurer official according to German law (Fig. 1). For this they visited the Ortsgericht in Frankfurt/Main on the 20<sup>th</sup> where their signatures were validated by a Notary.

This opportunity was taken to meet also on the 20<sup>th</sup> in Wolfgang's

house and discuss especially finances together with membership secretary Hossein Rajaei and with Marianne Espeland, who volunteered to become member of the financial committee (see also below) (Fig. 2). Marianne will assist Wolfgang especially with regards to communication with members around financial matters. The member and financial databases for SEL were designed by Wolfgang

in the program Filemaker and make the collaboration much easier. Membership cards and reminder letters can now immediately be printed from this database.

Several other matters were discussed in preparation of the coming SEL Council meeting in London 2018.



**Figure 1.** Wolfgang Eckweiler (right) is the new official treasurer of the SEL.



**Figure 2.** Informal Council meeting on September 20, 2017 in Frankfurt/Main (Germany). Membership secretary Hossein Rajaei, President Erik van Nieuwerkerken, Marianne Espeland, and Treasurer Wolfgang Eckweiler (fltr).

# New SEL committees

SEL President Erik van Nieuwerkerken; [nieuwerkerken@naturalis.nl](mailto:nieuwerkerken@naturalis.nl)

In the previous SELepidoptera News 59 (page 13) we announced two new committees to assist council for the coming years. Since then some members willing to participate have stepped forward, and here we can report that both committees have started off. Since these are not permanent committees in the sense of our By-laws, they will not be elected by the General Meeting.

**Future of SEL.** Next to council members Hossein Rajaei and Erik

van Nieuwerkerken, members Vazrick Nazari and Richard Mally have volunteered to become member of this committee. The purpose of this committee is to generate discussion on how SEL should evolve in the coming years, and what measures we need to take, e.g. in changing Statutes and By-laws. See more details in the previous Newsletter (no. 59). If you are still interested to join this club, let us know!

**Finances.** Marianne Espeland and Robert Trusch have volun-

teered to assist Treasurer Wolfgang Eckweiler, particularly in dealing with mailing of membership cards, invoices and correspondence about arrears in fees. Being all in Germany, the lines are short and they can meet up now and then as needed. Wolfgang remains the responsible council member for all financial matters, but it is possible that other committee members may be in contact with you when needed. ■

## Print of Nota Lepidopterologica delayed

Council regrets that due to the change of printing company, the printed version of Nota volume 40 (2017) was unfortunately much delayed. The volume will be posted early February 2018. If you did not receive Nota by March, please notify membership secretary Hossein Rajaei at [hossein.rajaei@smns-bw.de](mailto:hossein.rajaei@smns-bw.de).

The late issue of the printed volume does not affect publication dates, which are always the dates for the online publication of the individual articles at <https://nl.pensoft.net/articles>. ■

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### NOTA LEPIDOPTEROLOGICA



 <http://nl.pensoft.net>



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## New Books

**Checklist of the Lepidoptera of Germany, volume 3 in ENTOMOFAUNA GERMANICA, 2nd edition, edited by Reinhard Gaedike, Matthias Nuss, Axel Steiner & Robert Trusch in collaboration with the Entomofaunistische Gesellschaft e. V., 362 pp, 16 colour plates. Price: €30 plus shipping.**



The 2<sup>nd</sup> edition of the checklist by Gaedike & Heinicke (eds, 1999) presents a distributional list of all 3,682 Lepidoptera species recorded from Germany. The distribution of each species in the federal states is indicated in four periods: recorded only until 1900, last recorded 1901–1980, last recorded 1981–2000, and last recorded 2001–2016. A separate chapter deals with 312 non-native species which were accidentally introduced, recorded erroneously or whose occurrence is unexplained or doubtful.

Order via Entomofaunistische Gesellschaft, Geschäftsstelle, Postfach 202731, D-01193 Dresden or email: klausnitzer.col@t-online.de



Das Verzeichnis der Schmetterlinge Deutschlands (2. Auflage) enthält auf 362 Seiten (incl. 16 Farbtafeln) 3.682 Arten, die aus Deutschland sicher nachgewiesen sind. Das Vorkommen der Arten in den einzelnen Bundesländern wird in vier Zeitstufen angegeben: Nachweise bis 1900; Nachweise 1901–1980; Nachweise 1981–2000; Nachweise 2001–2016. Die Verbreitungstabelle wird ergänzt durch zahlreiche Anmerkungen zur Faunistik und Taxonomie einzelner Arten. In einem eigenen Kapitel werden 312 fragliche Nachweise, irrtümlich gemeldete, mutmaßlich eingeschleppte und nicht bodenständige Arten kommentiert.

Bestellungen bitte an die Entomofaunistische Gesellschaft, Geschäftsstelle, Postfach 202731, D-01193 Dresden oder E-Mail: klausnitzer.col@t-online.de



# The case of a female gypsy moth urticating: a lepidopterist caught lepidopterism

Jaan Viidalepp, Zoology collections, Institute of Agriculture and Environmental Studies, Estonian University of Life Sciences, Tartu, Estonia; vjaan@emu.ee

Alar Viidalepp, North Estonia Medical Centre Foundation, Tallinn, Estonia

**Abstract.** The gypsy moth has invaded Estonia 2009. The first population outbreak in oak forest was detected 2016. A case of strong urtication by a female specimen of the gypsy moth, *Lymantria dispar* (Linnaeus, 1758), is described. Urtication cases caused by gypsy moth larvae and, more often, by some other hairy larvae of moths from the Lymantriidae and Thaumetopoeidae families have only rarely been mentioned in Europe. Treatment of allergic urticaria is discussed.

**The object studied.** The gypsy moth is a widespread moth species, occurring in Eurasia and North America. It inhabits the deciduous forests zone of Europe. The northern distribution limits of *Lymantria dispar* and its abundance are ruled by climatic conditions.

The recent climate change has triggered the northward expansion or northward shift of the distribution area of this and other insect species. From 2009, first sporadic specimens were encountered on the mainland part of Estonia by forest service and amateur entomologists (Õunap 2013). The first specimen on Saaremaa island was taken in 2011, and, soon after, in

2016 the first mass outbreak of a gypsy moth population was discovered in Kõrkküla, Saaremaa (58°16'N, 22°16'E). The dispersal of the gypsy moth in Estonia is now monitored (Õunap 2013).

**The first case of lepidopterism in Estonia.** An Estonian lepidopterist was out moth-collecting on Hari-laid Peninsula, Western Saaremaa (58°58'N, 23°05'E), on a warm night on August 16, 2017. About twenty female specimens of *L. dispar* were attracted by the light source and a pair of voucher specimens was trapped. The gypsy moth females are driven to find secure places to lay their eggs. One of these moths found the collector's sleeve to be suitable for this purpose, crawled in, reached the elbow region, and started to struggle. After only a minute it set away, and mild skin irritation was felt a few minutes later on the proximal side of this arm. The allergic itching spread over the hand and also to the right side of the torso (Fig. 1). The man felt bad the next morning, but he was able to drive home to Tallinn. The allergic reaction and itching was treated at home using compresses with

calendula extract and hydrocortizone gel. Antihistamine tablets (one per day) were also used and the allergic reaction disappeared in four days.

The case described above may be exceptional, but the possibility of urtication disease must be taken into account in areas with gypsy moth outbreaks, via felling of dried trees near settlements, and one should keep eye on children playing nearby. The gypsy moth larvae are like handsome, multi-coloured, living toothbrushes.

**About bioecology of the gypsy moth (*Lymantria dispar*).** The moths are on wings during the second half of summer, with the males being day-active and flying at night as well; the females, after mating, seek ovipositing places after sunset. Mating probably occurs soon after a female has left its pupal skin, because the specimens coming to light begin to deposit eggs immediately (pers. obs. by the first author in East Siberia, concerning both *Lymantria dispar* and rosy gypsy moth, *L. mathura aurora* Butler, 1877). Moths lay their eggs in portions on trunks and the twigs of food trees, using a sticky secretion to fix eggs on the substrate (Spuler 1908: pg. XXIV). The gypsy moth female oviposits its 500-800 eggs, if not disturbed, in one more-or-less compact clump and covers it with scales from the tip of the abdomen. The larvae hatch from eggs after hibernating. Young larvae may use silk threads for airborne dispersal as juvenile spiders do (CABI 2017). They feed preferably on oak (*Quercus robur*), but may also make use of other deciduous trees. The gypsy moth larvae have dorsal secretory glands on abdominal segments. The secretion from these glands is disseminated on hairs and makes the larvae unpalatable to birds. As the hairs are easily breakable by



**Figure 1.** The allergic urticaria spread from the inner side of hand onto body.



contact, these may cause skin irritation or urticating reactions in animals and humans. This way, some sticky secretion is used by gypsy moth females to cover their eggs, and by their larvae as well, in to be unpalatable.

**What is lepidopterism?** Lepidopterism is a disease caused by the urticating scales and toxic secretions of adult moths, butterflies, and their larvae (Pallara et al. 2016). Most published cases of lepidopterism in Europe have been caused by contact with oak processionary caterpillars, *Thaumetopoea processionea* (Linnaeus, 1758) (Burri & Schniepper 2009; Maronna et al. 2008); their venom is also studied. It is “a protein cocktail containing thaumetopoein, a histamine-liberating toxin” (Gottschling & Meyer 2006). Urtications caused by gypsy moth larvae are investigated in USA (Wirtz 1984; Goddard 2012) and Japan (Kikuchi et al. 2012), but allergic reactions from adult moths of this species are seemingly rare (Anderson et al. 1983; Hoover 2000; Mullen & Durden 2009).

**Urticarial reaction.** Both mechanical irritation and injection of venom by the caterpillar spines or hairs contribute to the urticarial response in humans (Goddard 2013). The gypsy moth larvae possess two types of defensive setae. Longer, slender setae cause irritation to the skin, primarily due to mechanical damage. The shorter, smoothly tapered setae are connected with poison glands that produce histamine (Mullen & Durden 2009). The urticaria is thus likely caused by both a hypersensitivity reaction and a direct histamine release by the larva. Reactions vary from mild to moderately severe pruritus, erythema, and papule formation. First symptoms appear quickly and most cases resolve in a few days. In rare cases a systemic reaction is possible. The airborne hairs of adult gypsy moths can also cause hypersensitivity reactions and irritation to the eyes and the upper respiratory tract.

**Treatment of urticaria.** The general management of such urticar-

ial reactions is mostly supportive and only in rare cases necessitates a visit to the ER. As a supportive measure, it is recommended to wash the affected skin using soap and water without overly rubbing or massaging the area. After softly drying the site, gently stripping the site with adhesive duct tape can be useful in removing the remaining setae from the skin. Topical swabbing with alcohol or application of ice packs is useful for the cooling effect that reduces the local inflammatory reaction (Diaz 2005; Norris 2007). Urticarial lesions typically respond well to topical corticosteroid lotions and oral antihistamine drugs that effectively reduce the intensity of the symptoms. In case of acute respiratory symptoms or anaphylaxis, quick medical intervention in the emergency department is required.

#### Acknowledgements

We thank Aare Lindt for taking the photo and allowing us to use it in the publication. Our thanks go to the team of Oü Tölkete (Tartu, Estonia) for the linguistic revision of the text.

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# DO YOU THINK THAT SIZE REALLY MATTERS?

Maybe you don't. Or you do. In any case, you might want to lend this a hand, and you can if you can spare a few male specimens, reasonably identified at least to genus level.

Details: I would like to design a size index for the Lepidoptera, such that 'size' could be estimated from a few linear measurements as a correlate to dry body weight. To do this I need the dry body weight of male specimens a taxonomically varied sample of species of this order. A first approach was published in *Nota* (<https://nl.pensoft.net/article/5218/>) where you can check for the details. Soon after publication I decided that increasing sample size wouldn't probably be so difficult... while some entomologists would be able to contribute specimens of taxa not yet represented in my samples.

So I still need specimens of many 'rare' families (e.g. Cecidosidae, Agathiphagidae, Tineodidae, Andesianidae, Eriocottidae, Hedyliidae...) but also of some taxa that are probably represented in most collections, especially of microlepidoptera, such as Incurvariidae, Prodoxidae, Carposinidae, Batrachedridae, Heliodinidae and others, from anywhere in the world.

The problem: relatively large specimens (say, larger than 15 mm in wingspan if mounted with regular European insect pins and in numbers of three or more per species)

could be weighted as they are, as far as the weight of the pin can be estimated. However the insects mounted with minutiae have to be 'de-pinned' (because the weight of the minutiae is not constant and often is much larger than that of the insects themselves). While they won't be destroyed (and in case of damage I would do my best to fix the pieces), it is fair to admit that there is about a 50% probability that they will be more or less seriously damaged. Fully understandable, this is a reason why many institutional and non-institutional entomologists do not even answer my messages...

If, under these conditions, you can lend a hand, please contact me for details; I would send the full list of taxa already represented in my samples, and the 'desiderata'. Also, you might be able to suggest contacts of potential donors. What would you gain? Just Glory. Maybe you want to co-author the resulting paper: this will probably be submitted to *Nota* and will – no doubt – represent a milestone in the history of lepidopterology. Perhaps there are other options, please let me know!

*Enrique García-Barros, Dept. Biology, Universidad Autónoma de Madrid, Madrid, Spain; [garcia.barros@uam.es](mailto:garcia.barros@uam.es)*





# About *Cydalima perspectalis* in Belgium

Willy De Prins; willy.deprins@gmail.com

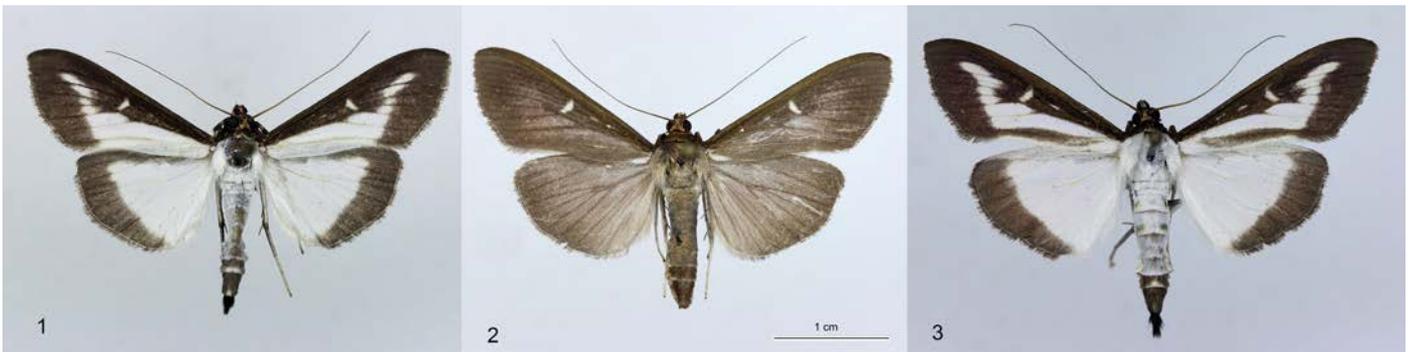
The first Belgian specimen of *Cydalima perspectalis*, the box tree moth, has reached in 2010 in the north of the country, vicinity of Antwerpen. Since then, the species has slowly spread through all the Flemish provinces (Antwerpen, Limburg, Oost-Vlaanderen, Vlaams-Brabant and West-Vlaanderen) and in this year it has been extremely common in many areas, sometimes in large numbers. In my own garden at Leefdaal (prov. Vlaams-Brabant) I counted up to 200 specimens each night in a small light trap with an 8W actinic blue lamp, though I do not grow *Buxus* in my garden. My two neighbours do (did!) and, although in springtime there were no signs of any frass, their bushes were completely devoid of leaves at the end of summer. Entomologists

like Steve Wullaert, operating light traps powered with 125W, 160W and even 250W lamps, counted up to 2000 specimens of the box tree moth in various localities in Flanders. In the Catalogue of the Belgian Lepidoptera, published on 2nd December 2016, the species was not recorded from the Walloon provinces at all, but in the course of 2017, the species spread over the five southern Belgian provinces as well: Brabant Wallon, Hainaut, Liège, Luxembourg and Namur. This is particularly annoying since our own native *Buxus* species, *Buxus sempervivens*, will probably be destroyed as well.

Apart from the well-known white form (Fig. 1), there is also a complete brown morph (Fig. 2) and a form that has a conspicuous

brown stripe just above the inner margin of the fore wing (Fig. 3). The two colour forms are much less common than the nominotypical white form and therefore, I tried to calculate the percentage of each three of them. Every weekend from mid-August till mid-September I caught all specimens of this species and counted the number of each form. In total I counted 1,169 moths divided as follows:  
white form: 870 specimens, 74.4%  
brown form: 195 specimens, 16.7%  
form with brown line: 104 specimens, 8.9%

It would be interesting to compare these figures with other populations and especially to study the genetic background. Mendel would be happy!



Figures 1–3. Known morphs of *Cydalima perspectalis*.



Figure 4. Hundreds of *Cydalima perspectalis* coming to light at Paal (Prov. Limburg, Belgium), 28.VIII.2017 (photo: Steve Wullaert)

# The *Stigmella salicis* complex: a request for material (Nepticulidae)

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*Stigmella salicis* (Stainton, 1854) was until recently regarded as a widespread, variable leafminer of various willows and sallows (*Salix* species), particularly the Great Sallow (*Salix caprea*), the Common Sallow (*S. cinerea* and *S. atrocinerea*) and the Eared Sallow (*S. aurita*). There had been doubts whether more than one species was involved over time and some names were variously considered as synonym or not, but overall the consensus was a single species, until a DNA barcoding study showed that material identified as *S. salicis* and *S. vimineticola* (Frey, 1856) together formed seven well separated barcode clusters, supported also by other genes (van Nieukerken et al. 2012). Since that paper we recognise now even three more clusters, and it was also shown that *S. arbusculae* (Klimesch, 1951) is a good species (cluster 4 in the 2012 paper). Distinguishing the clusters morphologically, particularly in the genitalia, remained a problematic point that we now try

to tackle with geometric morphometrics of the genitalia, already partly successfully. Also leafmines show some differences e.g. in egg position. The study is a collaboration by a number of European scientists, but we realise at the moment that we need more material especially from some parts of Europe to understand the distribution better and to get sufficient adult material to describe some of the clusters. The clusters 1, 2 and 3 are widespread in Europe, clusters 5 and 6 are much more restricted and some others occur in the Iberian peninsula and the Mediterranean islands. We are studying all names given in the group to decide which names are available for some of these, while other clusters need to be described as new species. We would welcome additional material, particularly reared specimens, if possible together with the leafmines, and leafmine material with larvae, either kept in ethanol, or dried within the mine, allowing DNA barcoding. Also trapped

adults could be useful, especially when from southern Europe. We already have a good coverage of material from most of Fennoscandia, the Netherlands and NW France and Great Britain, but material from every other place in Europe (and West Asia or North Africa) is welcome. Please contact me when you think you can contribute. Apart from miners on the cited species of *Salix*, members of the complex can also be found on *Salix viminalis*, *S. eleagnos*, *S. purpurea*, *S. dasyclados* (= *gmelinii*), *S. phlycifolia* and various alpine and boreal species.

## Reference

Nieukerken, E.J. van, Mutanen M., Doorenweerd, C. 2012. DNA barcoding resolves species complexes in *Stigmella salicis* and *S. aurella* species groups and shows additional cryptic speciation in *S. salicis* (Lepidoptera: Nepticulidae). *Entomologisk Tidskrift* 132: 235–255. <http://www.repository.naturalis.nl/document/363525>



**Figure 1.** *Stigmella salicis* leafmine on *Salix atrocinerea*, Netherlands (ZH), Leidschendam, Vlietland, 16.x.2017.



**Figure 2.** *Stigmella salicis* cluster 2 leafmine on *Salix caprea*, Netherlands (LI), Bunde, Meerstraat, 5.xi.2017.



**Figure 3** *Stigmella salicis* cluster 6, male, Great Britain (Hampshire), Portsmouth, leg. Langmaid & Thirwell 14.x.2011, reared in Leiden 11.iv.2012.



# Focus on Africa

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At the SEL Congress in Croatia in April 2017 it became clear that a considerable number of lepidopterists have a special interest in the African fauna.

Accordingly a gathering was convened in Kraków on 30<sup>th</sup> Sept/1<sup>st</sup> October 2017. Despite an unfortunate clash with the meeting of German speaking microlepidopterists no less than 32 people attended (Fig. 1).

The meeting was organised by Lukasz Przybyłowicz assisted by his colleague Jakub Sternalski with the generous support of Dr Sebastian Tarcz, Director of the Insti-

tute of Systematics and Evolution of Animals, Polish Academy of Sciences.

Most stayed at a hotel within walking distance of the Institute which is close to the historic Town Square in Kraków old town. A series of scientific presentations was followed which included the Afro-moths website and the African Natural History Research Trust, as well as taxonomic and faunistic papers. After the presentations members were able to see the collections of the Institute on Saturday and of MZUJ (Zoological Museum of Jagiellonian University) on Sunday.

Lepidoptera workshops had taken place in Ghana in 2011 and Uganda in 2014 and one is planned in Madagascar in April 2018. Members are considering possible locations for a fourth such workshop, this requires good contacts within the country and satisfactory arrangements for obtaining permissions.

The hope was also expressed that space might be found for an Africa workshop within future SEL Congresses. ■



Figure 1. Workshop on African Lepidoptera in Kraków, Poland.

# Ambassadors of the Neotropical Lowland Rainforest

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(all photos and figures in this article were produced by the author)

I'm sitting on the bus, traveling on the Panamericana from San José to southern Costa Rica. This is kilometre treinta y siete (37), near Rio Claro, Golfito. Zipping by me, nothing but endless kilometres of palm oil plantations and I'm already looking forward to the fragrance of the garden at Research Station La Gamba and to the steaming lowland rainforest that has survived there as a chain of large nature reserves. It is one of the most diverse regions of Central America in terms of animals and plants. My mission there: to attract moths in the rainforest and photograph them live. I'm an enthusiastic lover of nature which never fails to inspire me and do me good. As a designer and fan of the rainforest and butterflies and moths (Fig. 1), my idea is to capture the beauty and variety of moths in the rainforest of La Gamba in a book (Fig. 2) to show it to others as an art project created through knowledge.

## How it all began

Butterflies have been fascinating me since my early childhood; my father owned a collection of Euro-

pean and Tropical butterflies and moths. Their patterns, colours and forms have cast a spell over me ever since. As a child I painted them, marvelled at them from every angle or tried to find out their names. In those days, neither taxonomy browsers nor internet were available. In books I could find coloured prints or mostly painted pictures of rainforest habitats chock full of butterflies that looked simply unbelievable. For the first time, I fell victim to "tropical fever"! Even then it made me happy just to gaze in amazement at those multicoloured butterflies. A beautiful rainforest butterfly would leave me day-dreaming and the next day would inspire my performance on the soccer field. I was sure that I wanted to become a rainforest explorer. Yet it all came about quite differently.

I studied communication design and so I have been working self-employed for 26 years as a designer and received several international design awards. However, my interest in butterflies remained – even if it was displaced by other

things. Triggered by a traumatic event, I was searching for joy and happiness not burdening other people. I was looking for something constructive, something that I could do in the midst of nightmares and sleeplessness and fortunately I remembered from my childhood those brightly coloured, delicate butterflies. What followed was the book project "Scarlet Tiger and Nun – Shedding light on the secret lives of moths". It shows approximately 230 moth species from my own garden in southern Germany.

A further traumatic event came on top of the other and thus I decided finally to fulfil my dream of "exploring" in the rainforest. But explore what, and how and when? I'm not a scientist and certainly not an entomologist – I'm a designer and thus closer to the fine arts than to research. But I am very familiar with colours and forms and so I developed an "artistic project" in order to be able to "explore". It was to be a nature guide for moths in a rainforest and intended to convince people that there are



Figure 1. Armin Dett in the Costa Rican rainforest.

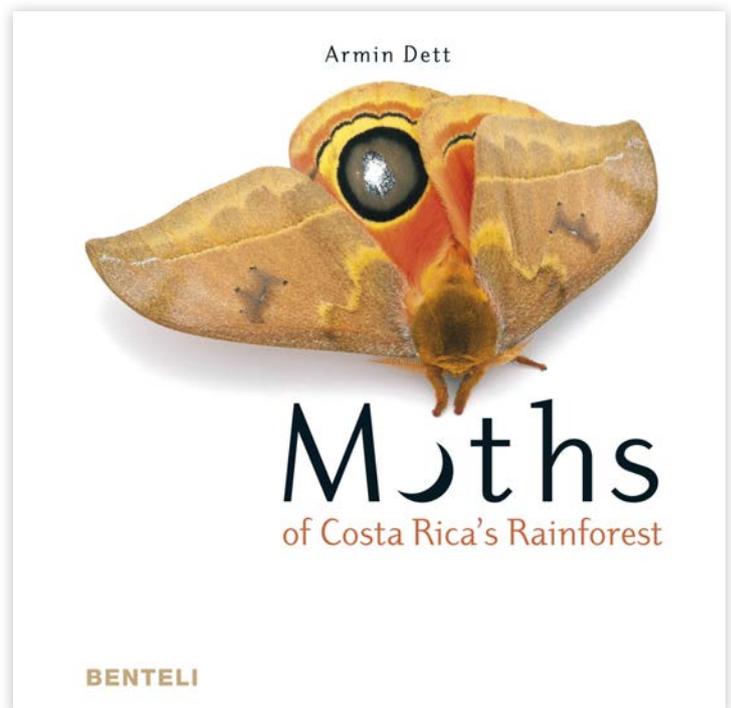


Figure 2. Cover of "Moths of Costa Rica's Rainforest" authored by Armin Dett

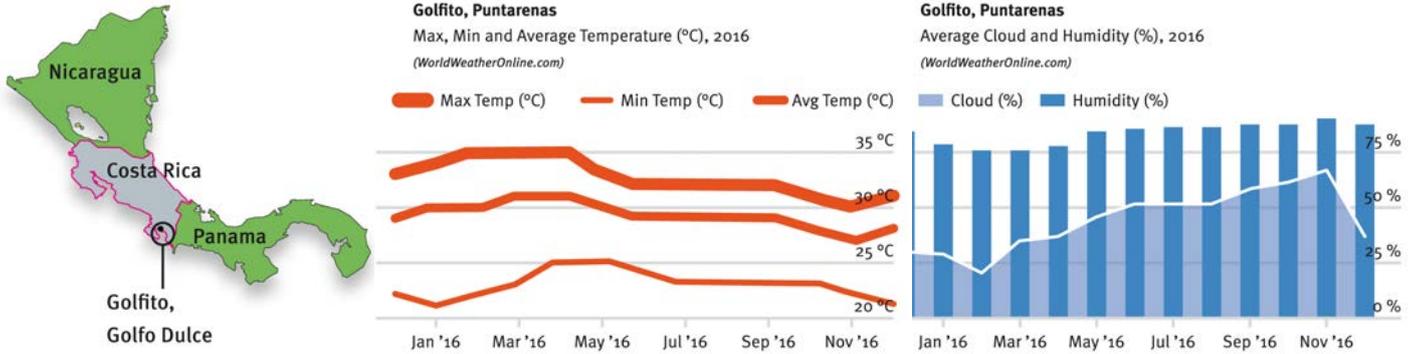


Figure 3. Locality and climatographs of the study area in Costa Rica.

fantastically beautiful moths that animate the heavens every night and that need our attention and appreciation before they, together with the rainforest that they enliven, disappear, giving way to palm oil plantations, forever. My idea was to attract moths at night using an artificial light source and to photograph them in the way they live and move. A plan for its implementation was needed.

### The experimental set-up

An absolutely decisive factor in realizing my vision of a moth



Figure 4. Impressions from the study area's rainforest.

book for a rainforest was a stay at the La Gamba Tropical Station in southwestern Costa Rica (Fig. 3), together with my family, which at that time was still intact. Its unique location at the edge of the Piedras Blancas National Park and its species-rich forests, the friendly and open people at the Station, in particular among the administrators, the encounters with scientists from various research areas, and the good working conditions including the laboratory and the station's garden, helped me form my plan. Setting out during the day from the Station on the rainforest paths (Figs 4, 5), I sought out locations where I could set up an artificial light source at night mounted on a light tower. Once having lured the nocturnal butterflies, I carefully trapped them in clear plastic containers and photographed them at the station's laboratory. To do this I developed a light plan with a studio set-up that I crafted myself in order to achieve final images that were consistently of the same good quality. In order to do justice to the richness of moth species, I limited myself each night to a relatively small number of species that I had not yet seen until then. In this way I was gradually able to become acquainted with the great diversity of species. Each trove of moths was then followed by a conceptual photo session that ended with releasing the moths undamaged. Thus several thousand images in RAW format were collected into a photo archive. From this archive the approximately 1,100 photos for this book in the form of a printed moth collection have come. Each individual image was followed by an image development in which I

would retouch for example spots, dust and scales that had fallen off the moths: painstaking work that took several months.

Anyone who has ever been out and about in rainforests will be able to understand that even just moving around in a rainforest is rather strenuous. Particularly when burdened with two motorcycle batteries, a good number of empty plastic containers and buckets, a 2-metre-tall light tower with two 60 cm fluorescent tubes (Blacklight Blue, Phillips 18 Watt/12 V and Sylvania 20 Watt/12 V), with a water bottle and some small emergency items – and all of this in rubber boots. On top of that the majority of the time alone, with sudden streaming downpours of rain on slippery forest paths. With strange, loud background noises and in absolute darkness for in the rainforest you can see neither moon nor starlit sky. I often felt overwhelmed and yet each night at the light trap I found myself filled with great tension and expectation: What beautiful moth will I be able to discover for myself this day of my life? For me these rainforest nights were very moving experiences that allowed me to forget injuries and losses and transported me into an absolute perception of the here-and-now. Highly concentrated yet deeply relaxed, happy and joyful.

### Each night at the light trap in the rainforest is an experience

In the nights at the light trap I encountered a great number of other animals and experienced beautiful and intensive natural phenomena. Frog concerts, luminous branches, poisonous snakes, and time and again fantastically beautiful moths.

Needless to say, as an artist and nature-lover I would ask myself upon each encounter: what was that this time then? Many other interesting insects of other genera (e.g. praying mantises) also came to the light trap in the forest – many of them immediately began to prey upon the moths landing on the light tower. So from the context of my moth project it is understandable that in this book I should also present a few frogs and reptiles and other insects – they too live in the rainforest and are moth predators. They are part of the overall experience when you are out on the paths at night in the rainforest or when you are scanning the plants with head lamp and flashlight for moths that have landed on them. Anyone who rebuilt my test set-up would be able to make similar observations. In addition, the fortunate circumstance that at the Tropical Station La Gamba you can meet other researchers and have the chance to talk to them informally and yet in a focused manner fills these tangential experiences with knowledge and unforgettable stories. Resulting from these exchanges with herpetologists, botanists and other scientists are the various contributions in this book, e.g. on the rainforest and on forest corridor projects (COBIGA and AMISTOSA) in southern Costa Rica and the nature conservation work (conservation and reforestation) that these involve. At least to some degree then, I would like to present my La Gamba moth project to readers also in the form of an overall experience. And especially to thank the authors of the expert contributions for their wealth of knowledge.

Art is free, asks questions, explains and makes visible – as does science. Through my book “Moths of Costa Rica’s rainforest” I would like to give a visual presence to unknown moths. Normally you find Neotropical moths only in collections and then you stand amazed at their beauty. Or you find them circling around lights in the garden of a hotel or you startle them when joining a guided night excursion. For this book I have put together 450 moth species and designed layouts



Figure 5. Impressions from the study area's rainforest.

for them. In the process it was important for me to use images that make it possible to identify them or to assign them at least roughly to families, subfamilies, or even to genera. Doing this all readers of this book will in future be able to identify by themselves a large number of Neotropical moths by close observation. I have focused predominantly on large moths and representatives of families that are frequently encountered. Normally regional nature field guides contain only a handful of butterfly and moth species, mainly well-known day-flying Lepidoptera, if any at all. It can be assumed that even local people seldom tend to know species of butterflies and moths. I became conscious of this when

I was on a night excursion on my way to the light trap site of the previous evening. I was looking for moths that were still perhaps in hiding when suddenly three armed park rangers on patrol stopped and checked me. Of the native moths they knew only the most prominent representatives (e.g. the *Rothschildia*), but they showed great interest and were quite moved after I told them about my project. They positively lit up when they saw my moth pictures and there was quite a buzz in the air when I showed them the draft pages of this book on my laptop.

One can surely assume that it would be impossible for any one person to see all the species of butterflies and moths that exist during



their lifetime, let alone recognize them. In Costa Rica alone, which is small in terms of surface area, it is suspected that there are around 16,000 species (including both small and large species of butterflies and moths). By comparison: in Germany there exist around 3,700 species. Worldwide there are approximately 160,000 known species. Other statistics that circulate are similar: Many researchers take as a basis 174,000 described species of butterflies and moths, with around 800 new species being added annually. A large proportion of these will surely never be able to be fully described or even appear in print – because, among other reasons, field work done by biologists or taxonomists continues to decline. Probably many rainforests and other habitats will disappear before their diversity of animals and plants was assessed. I am conscious of the fact that after just three sojourns at the Station (2014, 2015 and 2016) I have documented only a fraction of La Gamba's moth species.

Still, in my book 22 moth families are documented out of ca. 137 that exist worldwide. Ironically, however, this very fact shows the immense plethora of species and the task researchers are facing.

My art project shows at least a small portion of the butterfly and moth species that live in the forests at La Gamba. In all probability, the relatively small light source in the forest lured only those moths, that were residing in direct proximity to the light or actively flying around, or itinerant ones that had come across the light of my lamp and were attracted. Large sphinx and silk moths (Sphingidae and Saturniidae) would often circle fiercely around the light tower just to disappear again in the darkness before I could collect them. During other nights, huge numbers of species and individuals of those species arrived that it was hard for me to decide which ones to restrict myself to for photographing. The species compiled in the book are sorted at the beginning according to their design and for the most part according to the degree of relationship (superfamily, family, subfamily, genus, species) (Fig. 6) and specimens are arranged to scale to each other on single or double pages (Fig. 7). Some enlargements and some downsizings were necessary, not at least because in Costa Rica some of the world's largest butterfly and moth species are found (e.g. *Thysania agrippina*). Pages more suitable for identification are followed by others that display significant behavioural

patterns like threatening, warning, feigning death, preening and posing naturally (Fig. 8). Such behaviours are very difficult to document in collections – but often these are the very observations that help with identification and catch attention in the field. All photos show details in optimum quality (e.g. definition and chromaticity) but of course there were also limits to what was possible depending on the photo and its two-dimensional digital parameters, for example, in cases in which specific body parts (e.g. hindwings or undersides) were not visible to aid identification because of the moth's posture. However, the overall appearance of a moth species can still always be reproduced and the interested nature-lover can find further information with the aid of the internet and the species name.

To me as an artist, the photographically superior shot was of higher importance when selecting images than was the most important feature for identification. When taking the photos I at times also was not even yet familiar with the important distinguishing characteristics. As previously mentioned, several thousands of individual images resulted from the three stays at the Station (2014, 2015 and 2016). After digitally processing them, I went ahead

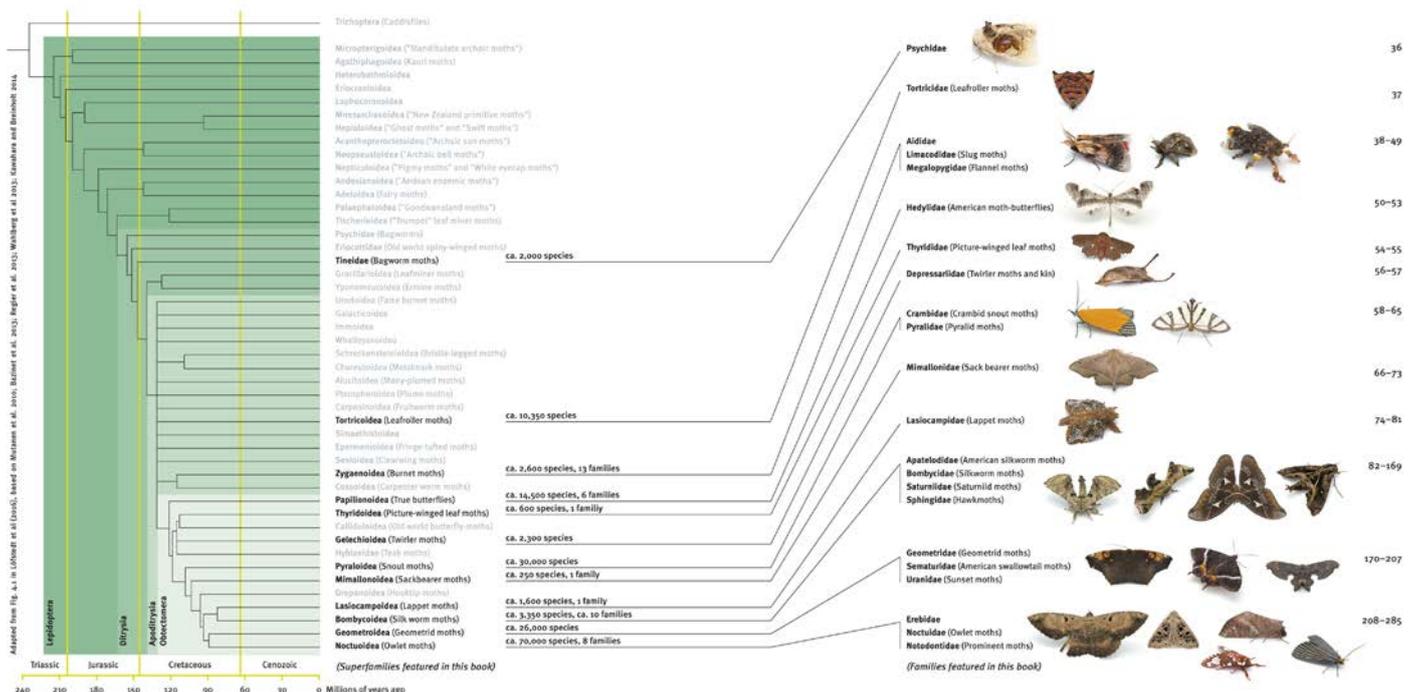


Figure 6. The sequence of moth displays follows current classification and systematics.



Scaling and hairiness can vary greatly in moths. Wing areas largely devoid of scales occur in the case of Arctiinae and Sphingidae.

Moths are no less colorful than butterflies. But blue and iridescent-blue colors are rarely found in moths.

Figure 7. Moths are arranged to scale to each other in the book.

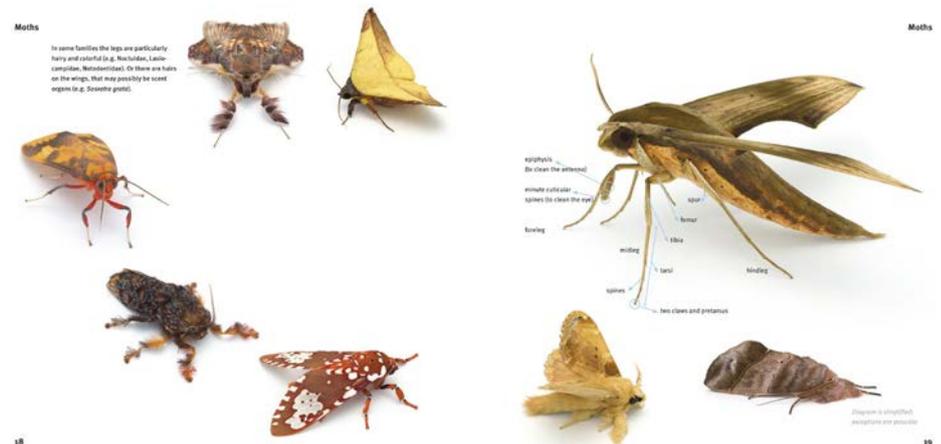
with sorting the species by degree of relationship (e.g. family) and distributing them over the pages of the book. To do this I studied all accessible sources, internet pages and some collections and books, but unfortunately this made me realize that many ambiguities and often even erroneous identifications or name duplications circulated online. Again many months passed in order for me to deal with this situation. Endless night hours spent at the computer followed, this time at home.

**A moth book in a digital world?**

As I see it, an art project needs a certain “physical quality” that touches people (intellectually and physically): a quality that is manifested, that can survive over a certain time span, that can be re-experienced, and that also holds a certain personal level that it gets from its author. I believe that a book meets this need particularly well – not a single millimetre of a book happened by chance; each image, each word is set in its place and in its form and size. Multiple copies are made and distributed in order to have an impact on people, perhaps to stimulate or motivate them. In contrast to a book, an internet page is quickly forgotten and who knows for how long there will be the internet anyway? Books,

on the other hand, can age. To me, the fact that I have the opportunity and the freedom to show Neotropical moths in book form to many readers on various continents is a really great thing. I received this opportunity and likewise trust from the Verlag Benteli publishing house represented by Markus Sebastian Braun. Much more than a screen, a beautifully designed page in a book is an invitation to study, to spend some time, to repose and yet be attentive. Without any electronic support the “Moths of Costa Rica’s rainforest” can be placed on your lap, given as a present or taken down from the bookshelf to be studied repeatedly. To my knowledge there is much more to be found on the internet than in

books on the range of topics that cover Neotropical butterflies and moths. There is probably no other book of this kind and with this kind of layout for any other rainforest, and even the renowned research stations in northern and central Costa Rica do not have any comparable presentation of the butterflies and moths in the forests that surround them. Surely the species found in these areas are different from those of the lowland rainforest around La Gamba. But my book on moths and butterflies does offer an introduction to common moth families – at least for night-flying moths.



In some families the legs are particularly hairy and colorful (e.g. Noctuidae, Lasiocampidae, Nymphalidae). Or there are hairs on the wings, that may possibly be used organs (e.g. Sesiidae genital).

Figure 8. Moths are shown live and with natural body postures.



## Defenceless but full of tricks – moth survival tricks

Every day and every night, eggs, larvae, caterpillars and butterflies wage a tough battle for survival against adverse environmental conditions, lethal fungi and murderous wasp stings, birds, bats and other insects. In this battle they use several survival tricks and behaviours that are in part illustrated in sequences in this book. Here I have concentrated on showing the tricks of the adult moths. It is true that the image concept and the studio lighting against a white background lead to a detachment of the moth from its surrounding landscape. But it is then all the more astonishing and convincing that the moths still resemble rotten leaves, broken twigs or animals with giant eyes. I would like to deal more specifically with two basic survival tricks that are to be found in different classifications: mimicry and mimesis.

### Mimicry in moths

Mimicry (faking of signals) describes a phenomenon in which a harmless species imitates shape or coloration of an animal that is capable of putting up a fight, e.g. a moth imitating a wasp, in order to thereby gain better chances of survival. Examples here are species of Neotropical tiger moths (Arctiinae), which imitate wasps

and bees. Likewise some saturniids (e.g. Hemileucinae) imitate large animals by means of eye spots on their hindwings. The development of these mimicry strategies is based on the fact that predators “remember” a bad experience because they memorize the external appearance of unpalatable butterflies and in the future avoid butterflies that have such an effect. This, however, requires surviving the unpleasant encounter. Yet not only external appearance can be deludingly imitated; so too can behaviour. For example, if a moth of the Megalopygidae family is repeatedly disturbed, it gives off a scent that smells like vinegar and makes a buzzing sound like that of a bumblebee. *Automeris postalbida* (Hemileucinae, Saturniidae) first tries to rescue itself from a threat by using the camouflage attire of its forewings – if the camouflage is not sufficient to get rid of the attacker, it abruptly unfolds its wings and directs them towards the troublemaker, flaps them rhythmically and presents their eye spots (Fig. 9). In this way it may be imitating a large animal that has been disturbed and that is possibly threatening or attacking. This way the already quite impressive size of *Automeris postalbida* becomes visually even larger. Species of the *Hypercompe* genus (Arctiinae) (Fig. 11) also resort to the chemical tricks list: In addition

to the bold histrionics with which they contort their contrasting colours of the abdomen, which they display with wings directed upward, they also release the sticky brown, evil-smelling contents of their intestines.

Frequently moths feign death by drawing their antennae and legs protectively up against the body or display the contrasting colors and/or shaggy setae of their body segments (e.g. Hemileucinae, *Pseudodirphia*, *Hyperchiria*, *Molippa* and *Periphoba*) (Fig. 10). In this way they manage to simulate annoyed bees and bumblebees that are protecting themselves by stinging. Representatives of the *Phobetron* genus (Limacodidae) are spectacular not only as caterpillars. When their adults feel disturbed, they perform impressive spider imitation by moving their legs which are covered with lots of dark setae. They stretch out their legs to all sides of their body and retract them again, which makes the moth’s body seem situated centrally like in a spider. At the same time the wings are closely attached to the body, which reinforces the impression of a wiggling spider. The slug moth *Perola sericera* fiercely moves its front legs, which it keeps interlocked and cocked, stretching them well out in front of the head.

The behaviour patterns and adaptations described above always



Figure 9. Mimicry versus mimesis in *Automeris postalbida* (Saturniidae).

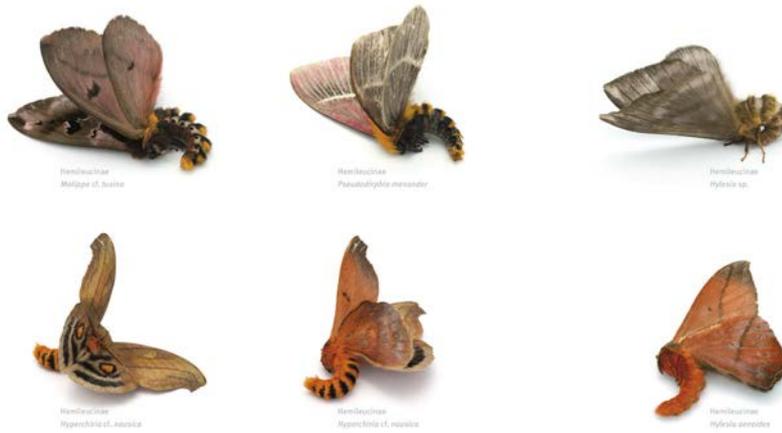


Figure 10. Feigning death in Hemileucine.

aim to deceive a possible aggressor by means of signals and create at the least confusion: moths gain time in which they can attempt to flee. *Automeris postalbida*, for example, suddenly flies off after several attempts to irritate and then disappears in the rainforest.

### Mimesis in moths

Some of the most frequent survival tricks of moths is imitating the habitat that surrounds them or parts of it, especially plant parts. The camouflage, which correlates with the habitat, is effective most particularly against enemies that are visually orientated. Thus, moths, that are active at night, are also protected during the day. Particularly in Costa Rican rainforests, that are inhabited by a great number of diurnal, insectivorous animals, camouflage during the day is important for survival. This is especially true since day and night are almost equal in length. If you roam the rainforest of La Gamba during the day the forest seems practically dead with all the animals being so well camouflaged. The camouflage experts include e.g. geometrids (Geometridae) of the genera *Micorgonia* and *Oxydia* (Fig. 12). These are of predominantly brown hues of all shades, with a few spots and a line that often runs seemingly continuously across all four wings causing the impression of a midrib of a leaf. The moths sit with open wings among dry leaves and at rest can barely be distinguished despite their quite considerable size.

On the other hand, representatives of the Geometrinae (Geometridae) are for the most part green in color, like fresh leaves with blotches. Many Prominent moths (Notodontidae) resemble broken twigs and little sticks. They sit with wings closed, roof-shaped, on branches, on tree trunks or close to the ground. *Hapigia gaudens* (Notodontidae, Heterocampinae) even imitates green lichens, whereas other representatives of the same subfamily imitate light or dark bark (e.g. the genus *Ginaldia*), moss or leaves, or perhaps even frogs (e.g. Phalerinae, *Rosema deolis*). The objective of many markings on moth wings is to use their pattern to visually break up the moth's shape (e.g. Nystaleinae, *Calledema contingata*) or to distract from the vitally important head and draw attention to "false eyes" (e.g. Spilomelinae, Acentropinae). It is particularly impressive to study this in the Eulepidotinae. Big bars distract from the vulnerable head and lead the eye towards the eye spots on the hindwings, which at the same time also have little tails, looking like false antennae. Large white wing sections additionally break up the overall shape of the moth at rest. However, in the plant kingdom it is not just brown and green hues that protect. Butterflies also camouflage themselves with flashy, shining colors when imitating blossoms, fruits, rotting perforated leaves, bark, lichens, moss, even light and shade. Anything is possible and also put into practice.

In addition to camouflage colours, warning colours with lots of contrast also play an important role in the moths' fight for survival. Often both strategies are evenly employed. *Othreis memorans* uses the full arsenal of tactics: the forewings have camouflage colours, with bright colour pigments and structural colors (iridescent effects) being featured. By contrast the hindwings have bright-yellow warning hues, set off by black stripes. Many moths intensify the deceptive effect of their wing patterns and colours by holding their body in a particular posture when at rest. It is very impressive to observe this in representatives of the Bombycidae, Uraniidae and Mimallonidae families. While *Cicinnus incerta* (Mimalloninae) (Fig. 13) imitates a dried-out and twisted leaf, *Erosia veninotata* folds its hindwings protectively over its vulnerable abdomen turning its four-winged habitus into a torn piece of leaf clinging to a tree trunk. *Epia muscosa* (Bombycidae) holds its forewings of contrasting colours in an almost rectangular shape with the hindwings hidden behind and the hairy legs and the body practically blending in with the substrate. Within a moth family a certain uniformity of appearance may predominate (e.g. Lasiocampidae, Notodontidae), but there are also groups of extremely variable habitus (e.g. Noctuoidea). Thus, identification of the species



Figure 11. *Hypercompe* sp. feigning death after excreting a repelling yellow fluid.



Figure 12. Geometrid moths, masters of camouflage.

in this book was laborious at times. **The printed Neotropical moth collection – selection of the species for this book**

In this book more than 450 species of 22 families are presented in a way that makes their beauty shine. It further intends to provide species names and make the species recognizable for the reader. I have therefore restricted myself to visually eye-catching moths to represent their respective kin – species that can be identified live in the field. The selection consists predominantly of large moths (makrolepidopteran), but also a few small moths (microlepidopteran) are shown because on the one hand they were the absolute majority of the moths at the light traps but on the other I could not be sure of their identification. Ultimately all animals were photographed live and subsequently released.

Each night at the light trap, I already limited the selection of moths to trap and photograph to 20–25 individuals. Most of them are males since females do not come to lights so frequently. I take all the more pleasure in having still some females in this book. Their presence confirmed that I was right in the middle of their reproductive habitat.

In the book I have included representatives of the nocturnal

Hedylidae family, which is currently regarded as part of the true butterflies (Papilionoidea). Because of being treated previously as part of the typical moth families I decided to include hedylids in the fauna of Costa Rica. One fascinating aspect of these “moth-butterflies” is the possession of a tympanal organ for detecting the calls of nocturnal bats. This mix of butterfly and moth characteristics together with the fact that they were attracted to the light trap was crucial in my decision to display them prominently in this book.

In cases of identification mistakes I ask for your forbearance. Both the helpful experts and I have made efforts to clarify all identification issues. But possibilities were limited, not least by the combination of time constraints, absence of any collected specimen (because there were only photos), lack of knowledge and editorial deadlines. The arrangements on the pages follow my own formal ideas and do not match scientific classification standards. Wherever it is helpful for identification for example, I have arranged the moths in the same positions and sizes (e.g. Hemiceratinae, *Hemiceras* sp.). Families are presented in page sequence whereby as a rule first a species representative of a family is shown magnified. The pages

that follow are displays of behavior patterns and decorative overviews with various perspectives. On each page the moths are illustrated in correct proportion to each other in size.

Figure 13. *Cicinnus incerta* (Mimallonidae) feigning death and imitating a dried-out and twisted leaf.



**Point, line, area, symbols and contrasts – butterflies and moths from the designer’s perspective**

The designer, who often must take complex content and functions and give them aesthetic and functional form, frequently stands speechless and in awe when confronted with nature’s great variety and beauty. At least this is what happens to me when I am studying, let’s say, butterflies, and particularly with moths. Nothing seems to be impossible in terms of creativity and every stylistic device learned when studying design can be found: points, lines and areas (Fig. 14). Also, all contrasts according to Itten can be detected: hue contrast, area contrast, cold-warm contrast, bright-dark contrast, quantity contrast, quality contrast, complementary contrast and successive contrast. Compositions with tension or with tranquillity, restraint or dominance, every conceivable form and structure – the full spectrum of artistic stylistic devices and aspects could be adduced for an image description of just one single moth wing. I draw happiness and joy from this, and in search for this nocturnal diversity, I first set out for my own garden in southern Germany (Palaeartic), and then for Costa Rica (Neotropical) to encounter an plethora I had never seen before.

While it is thought that the Palaeartic ecozone has around 24,000 butterfly species, in the Neotropics there are more than 55,000 species. Each species of butterfly/moth is a painting worthy of being discovered, studied and preserved. In every phase of development each species has a role in nature’s integral system that is of significance and that cannot be extinguished without consequences for nature’s network of relationships. This is the message I would like to point out with this book with its photographic, artistic insight into the vast number of moth species to be found in just one small forest region. Along with their extinction we would as well lose pieces of beauty and a wealth of ideas that bring us joy and happiness.

**My heartfelt thanks!**

Without any doubt at all, interpersonal relationships figure among the very best experiences in this art project. At the beginning of the project I felt rather “alone” – not only at night in the Costa Rican rainforest but also at home at the computer. Granted, I never met anyone who was not interested in my project and the beautiful moths. But where and how do you find experts who also help you, without running up expensive bills? Here is where I can mention some re-

ally fortunate encounters: first of all meeting my mentor Dr. Anton Weissenhofer (University of Vienna), who has been patiently answering every email since 2014 no matter on what continent he happened to be botanizing or whether he was sweating out in the field! Or meeting Prof. Dr. Konrad Fiedler (University of Vienna), who with great expertise guided and counselled me. But particularly I would here like to mention most especially Dr. Gunnar Brehm (University of Jena). Starting from my very first request he demonstrated his interest and was most helpful and particularly knowledgeable with regard to both science and art. Much of this book’s commitment and integrity is due to him.

Many friends and acquaintances have supported me in this art project on moths and so at this point I would like to extend my particular thanks to: Dr. Werner Huber, Dr. Wolfgang Wanek and Daniel Schaber for their contributions to the Research Station La Gamba and its surrounding rainforest; Dr. Anton Weber for his contribution to bioluminescence; Andreas Berger for his introduction to parasitic wasps and fungi in connection with moths, for his spirited work collecting in San Miguel and for his meticulous proofreading; Mi-

Moths



26

Moths



27

**Figure 14.** Point, line, area – moths from a designer's point of view.



chael Franzen for his generous contributions on amphibians and reptiles; Dominik Rabl for his expertise on moth communities at La Gamba. My thanks go to Dr. Ian Kitching (Sphingidae), Dr. Alexander Schintlmeister (Notodontidae), Dr. Rolf Mörzter (Erebidae, Noctuidae), Dr. Konrad Fiedler (all families), Dr. Michel S. Laguerre (Arctiini), Dr. Ryan St. Laurent (Mimallonidae, Saturniidae), Alberto Zilli PhD (Noctuidae); Harald Krenn, Klaus Riede and Viktor Hartung (other insect genera), et al.

My travels and the absence that they caused have been supported and endured by my children Amelie and Helena Dett and my girlfriend Sigrid. Sigrid and Helena

have even accompanied me to the light traps in the forest and Helena assisted in measuring captured moths. The days spent with my friend Paul who lives in Costa Rica with his loving wife Ches and who accompanied and supported me unconditionally in our firm, transatlantic friendship. He interpreted my wishes in all respects and also finally translated the German texts for the book. Neither must I forget Elias Padilla and his wife Maria who were kind hosts at Finca Alexis: I was even allowed to hunt moths at night in their living room! From all members of the Tropical Research Station La Gamba and especially from the Association for Promotion of the Tropical Research Station La Gamba I received

generous encouragement and financial support, and best of all, again and again their understanding for my restless nightly project.

**Information about the book:**

“Moths of Costa Rica’s Rainforest” by Armin Dett (editor, author of text and pictures, image processing and layout) 336 pp, 1.200 figures, in English, Verlag Benteli, released in 10/2017 first edition: 1,200 pcs, ISBN: 978-3-7165-1840-3, Price: 58,-EUR

A travelling exhibition is available with large-sized photo prints that can be loaned for a fee (contact armindett@kabelbw.de in case of interest).



Figure 15. *Automeris* in action.

# 10<sup>th</sup> International Congress of Forum Herbulot in Stuttgart (Germany) – registration has started

Hossein Rajaei, Staatliches Museum für Naturkunde Stuttgart, Germany; [hossein.rajaei@smns-bw.de](mailto:hossein.rajaei@smns-bw.de)

Hossein Rajaei (Stuttgart, Germany) and Axel Hausmann (Munich, Germany) would like to welcome you to the 10<sup>th</sup> International Congress of Forum Herbulot, entitled “Integrative Taxonomy, a multidisciplinary approach to answer complicated taxonomic questions”.

In this congress the attendees have the opportunity to present new results from their research on geometrid moths, but also other Lepidoptera if they are in common

interest. Additionally, we will have much time for discussions and for ‘social networking’. We invited several keynote speakers from around the world.

The congress will be closed with two attractive sightseeing programs (visiting the Black Forest, the city of Tübingen and the famous Hohenzollern Castle).

We encourage students to apply. There are several travel-grants available for them.

Date: June 11–16, 2018.

Venue: State Museum of Natural History Stuttgart, Germany (Fig. 1).

For registration and more information please contact Hossein Rajaei, email: [hossein.rajaei@smns-bw.de](mailto:hossein.rajaei@smns-bw.de)

■



Figure 1. State Museum of Natural History Stuttgart (Germany).



The Israeli Lepidopterists Society



# Butterflies of the Middle East - 3rd International Congress

The Steinhardt Museum of Natural History & Ramat Hanadiv, Israel

## 31.5-2.6.2018

### General Program

**1st day**, Thursday - 30/5/2018

Opening of the Congress and First Session with an emphasis on the butterflies of the Middle East: the Steinhardt Museum of Natural History, Tel Aviv Univ., 12 Klausner Street, Ramat-Aviv, Tel Aviv.

Registration - 08:00, Lectures - 09:00 - 16:00.

Welcome by Museum Chair - Prof. Tamar Dayan.

**2nd day**, Friday - 1/6/2018

Second session with an emphasis on butterfly monitoring in Israel and other countries:

Ramat HaNadiv, Zikhron Ya'akov,

Registration - 08:00, Lectures - 09:00 - 14:00.

Welcome by Mr Hugo Jan Trago Ramat Hanadiv CEO & Sustainability Coordinator - Dr. Racheli Schwartz-Tzachor.

**3rd day**, Saturday - 2/6/2018

Field Trip to Mt. Hermon.

Meeting at the lower Hermon cable car parking - lot at 09:30.

Guides: Dubi Benyamini, Stav Talal.

**4th day**, Sunday - Field Site to another Biotop - optional

### Registration to the Congress:

Fee - \$200 foreign guests, Register at - [parpar4u@gmail.com](mailto:parpar4u@gmail.com)

Free hosting and transportation in houses of members of the Israeli Lep. Soc. - for first 8-10 foreign guests.





Societas Europaea Lepidopterologica

## Combined Annual Meeting of The Lepidopterists' Society and Societas Europaea Lepidopterologica

Carleton University  
Ottawa, Ontario, Canada  
11-15 July 2018

### Preliminary Announcement: Mark Your Calendars!

The 67th Annual Meeting of The Lepidopterists' Society will take place **July 11-14, 2018** as a combined meeting with Societas Europaea lepidopterologica (SEL) at Carleton University in Ottawa. The meeting will be followed by excursions on July 15. The venue is within a 30 minute walk from the Canadian National Collection (CNC), the largest insect and Lepidoptera collection in Canada.

The 2018 meeting will follow the **Third North American Microlepidopterists' meeting**, to be held on **July 10, 2018**, at the K.W. Neatby Building in Ottawa which houses the CNC. Registration for both meetings will open by **March 2018**. Deadlines for abstract submission for oral or poster presentations will be announced at that time.

International travel support is available for LepSoc and SEL members upon application (Bryant Mather Award; <https://www.lepsoc.org/content/awards>).

For additional information or inquiries please contact the organizers at [lepsoc2018@gmail.com](mailto:lepsoc2018@gmail.com).

## Réunion annuelle combinée de la Société des Lépidoptéristes et de la Societas Europaea Lepidopterologica

Université Carleton  
Ottawa, Ontario, Canada  
11-15 juillet 2018

### Annonce préliminaire: marquez vos calendriers!

La 67e réunion annuelle de la Société des Lépidoptéristes aura lieu du **11 au 14 juillet 2018**, en tant que réunion combinée avec la Societas Europaea Lepidopterologica à l'Université Carleton à Ottawa. La réunion sera suivie d'excursions le 15 juillet. Le site se trouve à 30 minutes à pied de la Collection nationale canadienne (CNC), la plus grande collection d'insectes et de lépidoptères au Canada.

La réunion de 2018 suivra la **troisième réunion de Microlépidoptéristes en Amérique du Nord**, qui se tiendra le **10 juillet 2018**, à l'édifice K.W. Neatby à Ottawa qui abrite la CNC. L'inscription pour les deux réunions débutera en **mars 2018**. Les dates limites pour la soumission des présentations orales ou par affiche seront annoncées à ce moment-là.

Le soutien pour les déplacements internationaux sera disponible pour les membres de LepSoc et SEL sur demande (Prix Bryant Mather; <https://www.lepsoc.org/content/awards>).

Pour toute question ou demande d'information, veuillez contacter les organisateurs à [lepsoc2018@gmail.com](mailto:lepsoc2018@gmail.com).



## Membership 2018 – Mitgliedschaft 2018 – Cotisation 2018



Please remember that the subscription becomes due at the beginning of the year. The subscription for the year 2018 is 50 € for individuals and 65 € for associations. Please pay your 2018 subscription promptly either directly to the SEL account (preferred) or to the local treasurer in your country (see list below).



Nous vous rappelons que la cotisation annuelle est due dès le début de l'année en cours. Le montant de la cotisation 2018 est de 50€ pour les membres ordinaires et de 65€ pour les associations ou institutions. Si vous ne l'avez déjà fait, nous vous remercions de vous en acquitter rapidement par virement international au compte de la SEL (préférée) ou auprès du trésorier local de votre pays dont la liste est fournie ci-dessous.



Bitte beachten Sie, dass Ihr Mitgliedsbeitrag zu Beginn eines jeden Jahres fällig wird. Der Beitrag für 2018 beträgt für Einfache Mitglieder 50€ und für Institutionelle Mitglieder 65€. Bitte zahlen Sie Ihren Beitrag für 2018 pünktlich auf das SEL-Bankkonto (bevorzugt) oder an ihren lokalen SEL-Schatzmeister vor Ort (siehe Liste unten).

SEL Societas Europaea e.V. IBAN: DE63 3701 0050 0195 6505 07 Postbank Köln (BIC: PBNKDEFF)

### PayPal /Local SEL treasurers

Members living in outside Europe, or having difficulties in paying their membership fee via SEPA bank transfer may use PayPal or contact the local SEL treasurer. They should check, however, that the full amount of the membership fee is paid on the PayPal account and that all expenses, if any, are paid by the payee. Please contact: Wolfgang Eckweiler (SEL-members@eckweiler.com).

### Local SEL treasurers – Les trésoriers nationaux de la SEL – Die lokalen SEL-Schatzmeister

#### Austria

**Dr. Peter Huemer**

Tiroler Landesmuseum (Naturwissenschaften), Feldstrasse 11a, A-6020 Innsbruck, p.huemer@tiroler-landesmuseen.at, Tel. 512/587286; Beitrag bitte direkt auf das SEL-Konto (s.o.) überweisen

#### Belgium/Luxembourg

**Willy De Prins**

Dorpstraat 401B, B-3061 Leefdaal, willy.deprins@gmail.com. Please pay directly to the SEL account

#### Denmark

**Peder Skou**

Aamosen 1, Ollerup, DK-5762 Vester Skerninge, apollobooks@vip.cybercity.dk, Tel. 62-263737, Giro account 6580602. The ordinary dues are DKK 375,-; clearly state "SEL-2018"

#### France

**Prof. Michel Savourey**

481 Av. S. Pasquier, F-73300 St. Jean-de-Maurienne; CCP 3017455 Grenoble ou par Eurochèque libellé au nom de M. Savourey

#### Hungary

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#### United Kingdom

**Prof. Matthew Gandy**

Department of Geography, University College London, 26 Bedford, Way, London WC1H 0AP. m.gandy@ucl.ac.uk, Tel. 020 7679 5517. UK rates are £43 (members) and £56 (associations), Co-op Bank, sort code: 08-92-80, account: 12408690. Please pay promptly to avoid expense (and time) for a reminder

#### USA

**Eric Metzler**

P.O. Box 45, Alamogordo, New Mexico 88311-0045, U.S.A., metzler@msu.edu, Tel. 575-443-6250

# Societas Europaea Lepidopterologica (SEL)



[www.socourlep.eu](http://www.socourlep.eu)

Membership Secretary  
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## Application for membership / Aufnahmeantrag / Bulletin de souscription

(Please Print / bitte Blockschrift / Imprimez s.v.p.)

I hereby apply to become a member of SEL. I acknowledge the aims of SEL and agree to pay the annual dues.  
Ich beantrage die Mitgliedschaft bei SEL. Ich werde die satzungsmäßigen Ziele des Vereins beachten und die jährlichen Mitgliedsbeiträge bezahlen.  
Par la présente je souhaite devenir membre de la S.E.L., j'ai pris connaissance du règlement et des objectifs de l'association auxquels je souscris et accepte de régler ma cotisation annuelle.

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