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Fly Times is simultaneously distributed in PDF and printed format twice yearly, with spring and fall issues.

SCOPE

Fly Times accepts submissions on all aspects of dipterology, providing a forum to report on original research, ongoing projects, Diptera survey activities and collecting trips, interesting observations about flies, new and improved methods, to discuss the Diptera holdings in various institutions, to make specimen requests, to advertise opportunities for dipterists, to report on or announce meetings or events relevant to the community, to announce new publications and websites, to examine the historical aspects of dipterology and Diptera literature, to honor our recently deceased colleagues, and anything else fly-related that you can think of. And of course with all the images you wish to provide.

INSTRUCTIONS TO AUTHORS

Although not a peer-reviewed journal, all submissions are carefully considered by the editor before acceptance. We encourage submissions from dipterists worldwide on a wide variety of topics that will be of general interest to other dipterists, and hope that this will be an attractive medium for students through retirees to showcase their activities.

The requirements for submission are simple. Please send me a single-spaced text file (.rtf or .docx preferred) along with separate image files (.png or .jpg preferred).

Following are some specific do's and don'ts, bearing in mind that consistency among manuscripts is important:

- 1) *Do not* embed images into the text file (but *do* indicate in the text file approximately where each image should be placed).
- 2) *Do* submit image files of a reasonable size (no more than about 2MB per image file).
- 3) *Do not* use embedded styles (e.g., the various heading styles, small caps, paragraph spacing, etc.). *Do* limit styles to italics, bold, and (if you must) underline, and single-spaced.
- 4) *Do not* use different fonts, different font-sizes, or different colored fonts as headings. *Do* use Times New Roman, 11.5 point, black.

The approximate deadlines for submission are the middle of May and the middle of November, although this is flexible up to the time of publication (which will generally be early June for the spring issue and early December for the fall issue). For larger manuscripts your submissions may be considered for inclusion in the *Fly Times Supplement* series.

Please submit manuscripts to the editor-in-chief, Stephen Gaimari, at:

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and cc sgaimari@dipterists.org

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The North American Dipterists Society is a 501(c)(3) nonprofit organization (EIN 84-3962057), incorporated in the state of California on 27 November 2019. We are an international society of dipterists and Diptera-enthusiasts, serving the needs of the worldwide dipterist community.

Our Mission is to advance the scientific study, understanding and appreciation of the insect order Diptera, or true flies. To accomplish this, we aim to foster communication, cooperation, and collaboration among dipterists, and to promote the dissemination and exchange of scientific and popular knowledge concerning dipterology.



As an **international society**, there are no boundaries, and our core activities are geared towards all dipterists, not a subset. We aim to provide a common stage for all people interested in flies, a place where our community can closely interact. Among our core activities, we produce Society publications such as this one (as well as the *Fly Times Supplement* and *Myia*), facilitate or organize Society and other Diptera-related meetings and events, provide grants and awards in support of dipterological activities and achievements, perform outreach activities and provide educational resources to those who need them, and maintain an organizational website, an online Directory of World Dipterists, a dipterists mailing list server, and social media presence. In these efforts, we as a group can make our society as successful as we want!

A note about Society membership – To thrive as an organization and to provide all the resources we can for the dipterological community, we need your support through becoming a member (<https://dipterists.org/membership.html>) or making donations (<https://dipterists.org/support.html>). Please see our website to understand our vision for our society!

From the Editor – Welcome to the latest issue of *Fly Times*! As usual, I am very impressed with the variety of excellent submissions, and I hope they are enjoyable to the readers. With preparations going on for the 10th International Congress of Dipterology, I am later than usual in starting to put this issue together, but still managed to get it out during spring! Please consider writing an article or two for the next issue, which is slated for fall of 2023. And for larger works, please consider the *Fly Times Supplement* series, which can be found at https://dipterists.org/fly_times_supplement.html.

Also note, I am (still) hoping to improve the front and back covers of the *Fly Times*. This time around was certainly not the best one, given how much time has been devoted to the Congress, so again, this is for the (near) future! Some of you clever dipterists might have good ideas for this – please consider submitting them! There are several options – to have different covers with each issue, or like most journals, to have a static cover from issue to issue. Or even to switch it up each year, or every once in a while. So please feel free to send your design ideas to me at sgaimari@gmail.com (cc sgaimari@dipterists.org).

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NEWS AND RESEARCH

CHILMONDOLI¹ – Biodiversity patterns in long-legged fly communities (Diptera: Dolichopodidae) of coastal and Andean mountain ranges in Chile

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Summary

Due to its topographic isolation, Chile differs greatly from any other Neotropical country in terms of habitats and species, in particular invertebrates, with a large proportion of endemism. The Valdivian temperate rain forest biome in southern Chile is under increased pressure, while its invertebrate biodiversity remains poorly known. As long-legged flies (Diptera, Dolichopodidae) are excellent bio-indicators, information on their species richness and community structures might serve well as additional tool for conservation measures. Also, considering the recent vast wildfires in central and southern Chile, the collected data might as well be used as a historical baseline for the investigated and similar areas.

In order to gain information on dolichopodid biodiversity, 3 national parks / reserves in the coastal and 3 in the Andean mountain range between 39°51'S and 42°42'S were investigated from November 16 till December 15, 2022. In each of these protected areas, multiple sites were selected in Valdivian temperate rain forest for sampling by traps. Per area 120 pan traps were employed, distributed over 4 (each with 10 trap units; trap unit = 1 blue, 1 yellow and 1 white trap) to 8 sampling sites (each with 5 trap units) depending on the habitat diversity encountered. In addition, one Malaise trap was installed in at least one of these sites. Furthermore, Dolichopodidae and other invertebrates were collected with sweep nets, outside the six study areas as well. In addition, in each area also one site outside the national park / reserve was investigated with traps. This sampling strategy ultimately produced 362 entomological samples, some of which contain thousands of long-legged flies. Despite a troublesome start, the expedition can be considered truly successful.

1 Objectives of the mission

With this survey we wanted to answer the following questions:

Main research questions:

- What is the structure of dolichopodid fly communities of coastal and Andean mountain ranges in southern Chile?
- Where do Chilean dolichopodid species and communities fit into Neotropical dolichopodid biodiversity and biomes?

¹ This acronym refers to CHILean MONtañas (mountains) and DOLIchopodidae

Supplementary questions:

- What is the **dolichopodid species richness and diversity** in Valdivian temperate rain forests?
- What are the **ecological characteristics** of the different dolichopodid species?
- What proportion of the Chilean Andean faunas is represented by **Achalcinae**, and what is their relationship with Achalcinae from other Neotropical areas?
- How can we unravel the **paraphyletic *Somillus* lineage**?

2 Organisation, study area and sampling sites

With a length of 4,200 km (latitude between 17°S and 55°S), a width of max. 150 km and entirely enclosed by natural barriers (deserts in the north, subantarctic conditions in the south, the Pacific Ocean in the west, and the Andes in the east), Chile can be considered a continental island and very different from the Neotropical region (Morrone 2018). During the first Chilean expedition in 2013, sites were investigated in the Andean mountain range distributed over 4 regions (Maule, Bío-Bío, Araucanía, Los Lagos). In 2022 we focused on the Región de Los Ríos and the Región de Los Lagos, and sampled both the coastal and the Andean range (**Figure 1**). This provides us with a small overlap between both surveys. Sites in the area between latitude 39°51'S and 42°42'S were sampled, mainly for Diptera. The following six national parks (PN) / reserves were selected for Malaise and pan trap sampling:

Coastal mountain range:

- 1 PN Alerce Costero – Región de Los Ríos
- 2 Reserva Costera Valdiviana – Región de Los Ríos
- 3 PN Chiloé – Región de Los Lagos

Andean mountain range:

- 4 PN Puyehue – Región de Los Lagos
- 5 PN Vicente Pérez Rosales – Región de Los Lagos
- 6 PN Hornopirén – Región de Los Lagos

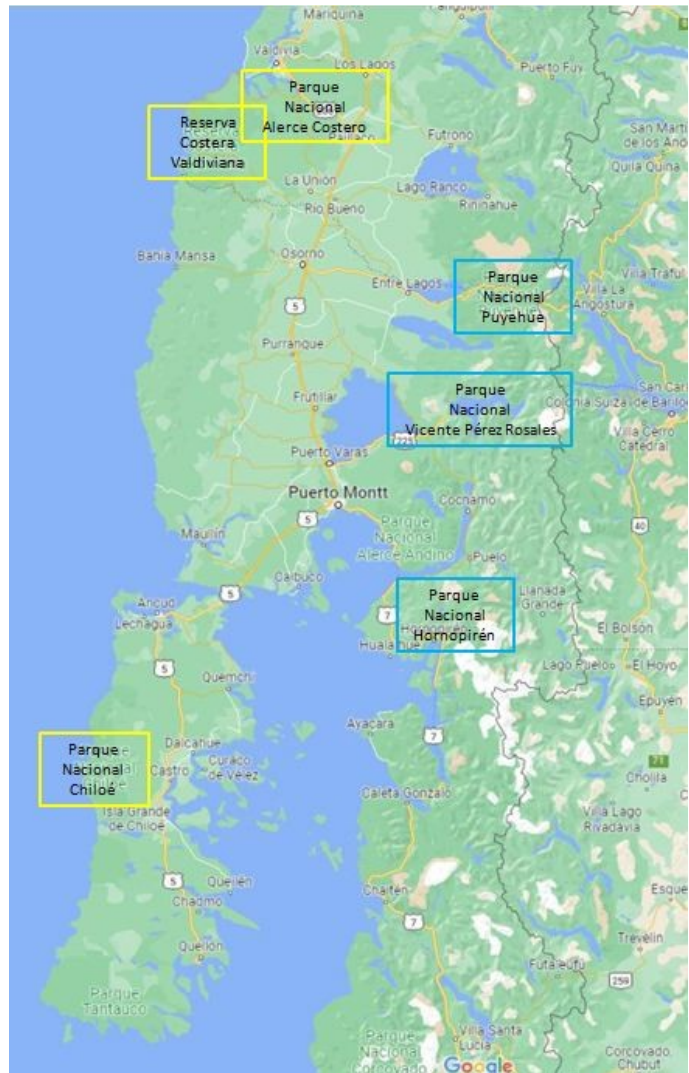


Figure 1. Investigated areas in the 2022 expedition

Upon arrival in Puerto Montt (airplane), we passed by Osorno to purchase storing liquids alcohol and formaline and travelled to our first accommodation in San Carlos (Corral), north of PN Alerce Costero and south of Valdivia. Despite the logistic problems at the start of the expedition (see **6 Concluding remarks**), we succeeded in implementing our initial sampling scheme: in each of the 6

investigated areas we sampled for 2-4 days using Malaise traps (MT), pan traps (PT) and sweep nets. We selected 4 to 8 pan trap sampling sites where we installed 5 or 10 trap units² resp. In addition to the 120 pan traps installed in or near protected areas, we also managed to have a sampling site close to our accommodations (mostly rural area), where we installed 5 pan trap units, sometimes together with a Malaise trap. This must provide us with a first impression about the fly diversity outside the protected areas and as such, indications whether certain species are confined to the latter areas or have a wider occurrence.

In order to select the most representative and/or promising sites for pan trap sampling, we decided to explore the area immediately upon arrival without any equipment. During this first visit we selected the sampling sites where traps were installed later on that day (afternoon). Traps were serviced once and removed the day before we travelled to another area or on the day of departure, depending on the travel distance.

Figures 2 and 3 present a selection of sites investigated with traps and sweep nets resp.

3 Material and methods - collecting techniques and strategy

Three major collecting techniques were used because of their effectiveness and complementarity: Malaise traps (see **Fig. 2B, E**), pan traps of three different colours (see **Fig. 4A, C-D**), and sweep nets. In a few cases, dolichopodid flies on hard surfaces were collected with a small plastic jar. An alcohol solution (70%) was used as fixative liquid in the collecting jar of the Malaise traps, and a mild formaline + detergent solution in the pan traps. After installation, traps were serviced only once and removed subsequently. While servicing the pan traps, the formaline solution was captured and re-used in the following study area. In this way, we kept pollution of the environment and expenses to a minimum. Traps were operational between 2 and 4 days depending on the time of arrival at, and departure from, the area. A pan trap sample is composed of the yields of 5 pan traps of the same colour in the same site. I.e., a site with 10 trap units (each with three pan traps, see **Fig. 4A**) thus produces 6 pan trap samples, one with 5 trap units only 3. All samples were stored in whirlpaks with an 70% alcohol solution.

The **standard trap sampling scheme** ultimately yielded **135 pan trap** and **7 Malaise trap samples** during **2,181 trapping days**. Nine pan trap samples could not be gathered: in one site 5 trap units were taken away by park visitors, while in another site all 10 trap units were flooded by the rising tide. In addition to this scheme, in each of the 6 investigated areas we selected one site beyond the protected area where we installed 5 pan trap units, in three cases together with a Malaise trap.

Another 220 samples were collected in and outside the protected areas (193 with sweep nets, 4 collected by hand, 20 with pan traps and 3 with Malaise traps) producing a **total of 362 entomological samples**. Thirty-nine sweep net samples contain large to very large numbers of long-legged flies (Dolichopodidae). In cases where these insects occurred in large numbers, sweep net yields were transferred to a large collecting jar with alcohol directly after collection, without retrieving individual specimens (see **Fig. 4B**). This way of sample collection saves a lot of time in the field but requires much more time during the subsequent sample processing phase.

2 One pan trap unit is composed of one blue (BPT), one yellow (YPT) and one white pan trap (WPT). Pan trap sampling sites were investigated with 5 or 10 of these trap units, depending on the diversity of habitats determined during an initial exploration visit. A higher habitat diversity ultimately lead to more sampling sites with less (only 5) trap units.



A, PN Alerce Costero (site PT/MT02)



B, Reserva Costera Valdiviana (site PT/MT02)



C, PN Puyehue (site PT01B)



D, PN Vicente Pérez Rosales (site PT02)



E, nr PN Hornopirén (site PT/MT01)



F, PN Chiloé (site PT02A)

Figure 2. A selection of sites investigated with traps (see also Table 1).

As observed during previous expeditions and other sampling campaigns, immediately after installation Dolichopodidae arrived in the traps – often already during the filling of the traps with formaline solution – especially in the yellow ones, sometimes even in numbers (see **Fig. 4A, C-D**).

4 Results - sample and data processing

On December 16, all samples were **transferred** to the Belgian lab for processing. There are no special **CONAF** (National Forest Corporation (Corporación Nacional Forestal)) requirements to export specimens of non-protected species. In order to get the high amount of non-dolichopodid

specimens studied that were collected during the 2013 expedition in the Andean Cordillera in southern Chile – with financial support by the Leopold III Fund – a worldwide network was set up involving 31 taxonomic experts from 11 different countries. This network will be remobilized once it becomes clear which taxa are present in the collected samples. A first inquiry among some of these experts confirmed a great willingness to engage again.



A, river bank (PN Alerce Costero)



B, salt marsh (Chaihuin)



C, bank of Lago Toro (PN Puyehue)



D, salt marsh at low tide (Hornopirén)



E, salt marsh at high tide (Hornopirén)



F, coastal lagoon (Cucao, Chiloé)

Figure 3. A selection of sites sampled with sweep nets only.

At least the same 17 fly families as in 2013 will be pulled from the samples, together with Coleoptera, Opiliones and Orthoptera. The same agreements as applicable for previous expeditions (see Touroult *et al.* 2018) will be employed and encompass rules concerning the return (and timing) of material and data. Dolichopodid specimens will be **examined** to morphospecies level (or identified) and temporarily stored in the personal collection of the first author (see also **5 Deposition of entomological material**). Representatives of the subfamily Achalcinae and some selected genera will be examined in more detail and incorporated in his ongoing projects.

Data on sampling sites, samples, species and specimens will be stored in a private Microsoft Access database, NEOTROPICS, currently holding data on nearly 14,000 samples (excl. IBISCA) from 22 Neotropical countries and managed by the first author.

Table 1. Overview of sampling sites and applied sampling strategies.

Investigated protected area (area code)	no. of sites	latitude	longitude	altitude (m)	Sampling period	Number of traps [§]			
						BPT	WPT	YPT	MT
PN Alerce Costero (CL-2022-AC)	7	39°56'54.1"S - 39°57'32.5"S	73°33'15.1"W - 73°31'58.9"W	6 - 30	19-21/11/2022	40	40	40	1
Reserva Costera Valdiviana (CL-2022-RCV)	7	39°57'31.7"S - 39°58'16.9"S	73°34'42.6"W - 73°34'01.5"W	4 - 13	22-25/11/2022	40	40	40	1
PN Puyehue (CL-2022-PU)	8	40°39'50.2"S - 40°40'08.9"S	72°10'37.1"W - 72°10'24.6"W	351 - 390	26-30/11/2022	40	40	40	1
PN Vicente Pérez Rosales (CL-2022-VPR)	8	41°08'04.4"S - 41°12'02.4"S	72°24'03.5"W - 72°32'32.9"W	55 - 207	2-5/12/2022	40	40	40	1
nr PN Hornopirén (CL-2022-HO)	8	41°53'40.0"S - 41°53'39.4"S	72°23'46.6"W - 72°23'37.3"W	154 - 199	6-9/12/2022	40	40	40	1
PN Chiloé (CL-2022-CH)	7	42°37'27.7"S - 42°37'16.5"S	74°06'26.9"W - 74°06'44.5"W	8 - 19	11-14/12/2022	40	40	40	2
Totals	45					240	240	240	7

[§] BPT: blue, WPT: white, and YPT: yellow pan trap; MT: Malaise trap

5 Deposition of entomological material

During the examination of the Dolichopodid specimens, the collection will thus temporarily reside at the Belgian lab. Ultimately, type material (including holotypes) will be deposited in the Museo Nacional de Historia Natural de Chile ([MNHNCL](#), Santiago). Depending on the number of specimens available, a fair number of paratypes and other identified specimens will also be deposited in the entomological collections of RBINS and in the collection of the resp. taxonomic specialist. This also holds true for the other invertebrates.

6 Concluding remarks

The expedition had a **rough start**: upon attempting to board in Madrid to Santiago, the IBERIA people refused our boarding passes and referred us to a LATAM flight that had been cancelled without informing us. Ultimately, LATAM officials provided a detour flight to Lima (Peru) before moving on to Santiago and Puerto Montt where we arrived on November 16. As expected, our luggage containing all our sampling equipment did not follow until November 18

(afternoon). Another reason why the sampling was launched only on November 19 was a nationwide strike by park guards that could have jeopardized our entire project. A further hiccup was the omission of one of the national parks in our collecting permit which was also taken care of in the end. From then on, the campaign went really smoothly, efficiently and was truly productive.



A, one pan trap unit (coastal dune grassland, Chaihuin)



B, sweep net sample (salt marsh, Hornopirén)



C, pan trap after 2 days (coastal dune grassland, Chaihuin)



D, pan trap after two days (marshland, PN Alerce Costero)

Figure 4. Yields of pan traps and sweep net collecting.

Our **new sampling strategy** really paid off, i.e. starting with an exploration of the habitats along trails (morning) followed by the transportation of equipment and installation of the traps (afternoon). Inevitably this caused shorter collecting periods but, on the other hand, it enabled us to select the most promising and species rich sites.

Also, the **timing of our expedition** was optimal and coincided nicely with the optimal period in the season. Unlike our previous expedition to Chile in January 2013, we carried out field work at the end of Spring - early Summer (= peak activity period of Dolichopodidae) in each of the areas. Indeed, we started in the north (PN Alerce Costero) mid-November and slowly moved south where we finished on Chiloé mid-December. Even during field work and a first screening of the samples, it is clear that we collected species that we have not seen in 2013. The samples are assumed to be a substantial addition to the current collection of Chilean Dolichopodidae.

Finally, the collected samples might become more valuable than initially anticipated. Indeed, considering the vast wildfires that rage through central and southern Chile ever more frequently (<https://www.conaf.cl/situacion-nacional-de-incendios-forestales/>), the data collected here might possibly serve as a historical baseline for the investigated and similar areas.

7 Acknowledgements

First of all, we want to thank a lot of people that contributed directly or indirectly to the success of this expedition:

- the **CONAF staff** for their help with the research permit and during the preparatory phase: Sr. Ricardo Rodríguez Carreño (Gerente de Areas Silvestres Protegidas), Sr. Patricio Contreras Bravo (Sección Conservación de la Diversidad Biológica Región de Los Ríos), and Sra. Gisela Toledo Knittel (Encargada Sección Conservación Diversidad Biológica de la Región de Los Lagos);
- the **Staff of the Reserva Costera Valdiviana**: Sr. Francisco Torres, Sr. Danilo González and several colleagues in the Chaihuin station for their hospitality and assistance;
- many **guardaparques of CONAF** (see **Fig. 5**): we want to express our special gratitude to some of them: Sra. Tamara Olguín (PN Alerce Costero) for successfully negotiating about our access to PN Alerce Costero during the strike of the CONAF park guards; Sr Miguel Otárola Pino, and colleagues Daniella Cuyul and Rafael Chamorro (PN Chiloé) for their guidance in selecting the most interesting sites; a special tribute is paid to Sr. Juan Pablo Vega Rodríguez (PN Vicente Pérez Rosales) who fixed the permit problem (**see 6 Concluding remarks**) in one single day. And last but not least Sr. Jonathan Maximiliano Corvalán Oteiza and Sra. Maria Ivette González (PN Vicente Pérez Rosales) for their uttermost hospitality and kindness;
- the guards of the **Cabañas Anticura** domain for their helpfulness and good spirit;
- many thanks are also due to the **owners / managers** of the lodges and cabañas where we resided. Special thanks are due to Sr. Joel D. Rodríguez Cruz and Sra. Ana Maria “Anita” Carvallo Fuster (Cabaña Lourdes, San Carlos, Corral) (**Fig. 5**) who provided crucial help with retrieving our luggage and made our staying truly memorable.

Finally, we are very grateful to the **Leopold III Fund** (Brussels, Belgium) and **FWO-Vlaanderen** (Brussels, Belgium) for the financial support.

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9 Invitation to collaborate

As mentioned above, during sample processing next to Dolichopodidae, also other dipteran families will be sorted. If you might be interested to study certain fractions, just get in touch with the first author (mpollet.doli@gmail.com) to work out an arrangement. If this is done in time, and if you participate to the 10th International Congress of Dipterology in Reno (July 16-21, 2023), the material might be handed over there.



Sr. Juan Pablo Vega Rodríguez
[PN Vicente Pérez Rosales]



[from left to right] Sra. Maria Ivette González, Mrs Anja De
Braekeleer and Sr. Jonathan M. Corvalán Oteiza



Sr. Joel Rodríguez Cruz
[Cabaña Lourdes]



[from left to right] Marc Pollet, Sr. Miguel Otárola Pino, and
colleagues Sra. Daniella Cuyul and Sr. Rafael Chamorro [PN
Chiloé]

Figure 5. People that contributed substantially to the success of the expedition.

**Discovery of sensory pegs in *Prionocera* and *Angarotipula* (Diptera, Tipulidae):
first record of such sensillae in Tipuloidea larvae**

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Larvae of the long-palped crane fly, *Prionocera turcica* (Fabricius, 1787), were collected from a water trough in Scotland, preserved and examined (Hancock, 2021) Although none from this particular batch were reared this species is common locally and adults occur at the same location. It is not possible to distinguish between *Prionocera* species using larval morphology. Larvae were examined closely and sensory pegs or sensillae were observed (Fig. 1).



Fig. 1. Anterior of *P. turcica* with sensory pegs indicated by red arrows.

Microscope slide-mounts were prepared to use transmitted light for examining under higher magnification. Examples were slit along the length of one side, macerated in potassium hydroxide and opened out to lie flat before placing in mountant under a long coverslip. Identifiable sensory pegs were found on all body segments and mapped schematically (Fig. 2). The chaetotaxy of tipuloid larvae has been studied comprehensively but no reference has been made to these organs in earlier sources (e.g., Chiswell, 1956; Theowald, 1957 & 1967; Brindle, 1960; Lantsov, 1984; Gelhaus, 1986). The detail necessary for mapping the setae would have been sufficient to detect such large mechanoreceptors but there has been no mention of them. As part of this investigation a freshly collected selection of common British *Tipula* species have been examined using the same methodology to search specifically for sensory pegs and confirms their absence.

Searching more detail for *Prionocera* lead to the study by Brodo (2018) of *Angarotipula* in which the relative position of the two genera is analysed. Having described the morphology of the adults and juvenile stages she added a phylogenetic tree utilising molecular data. This placed them together in a sister group separated from *Tipula* and supported the status of *Angarotipula*, having once been a subgenus of *Tipula*. Personal contact with Fenja Brodo resulted in an offer of preserved larvae from her collection. This has allowed the comparison of the Scottish *P. turcica* with Canadian examples of

the same species along with specimens of *P. dimidiata* (Loew) and *P. unimicra* (Alexander) that shows them to have identical arrangements of sensory pegs. An example of larva of *A. tumidicornis* (Lundström) possesses them but in reduced numbers restricted to singletons on the thoracic tergites and sternites (Fig. 3). Their presence in both genera adds an additional character for the relationship between the two genera and a separation from *Tipula*. Detail of the appearance of these sensory pegs from slide preparations is shown in Figs 4 & 5. It is noted that in *Prionocera* the second and third thoracic and first abdominal segments have a peg on the anterior margin adjacent to the intersegmental membrane. The sensory pegs are all medial in position and become progressively smaller towards the posterior end of the larva.

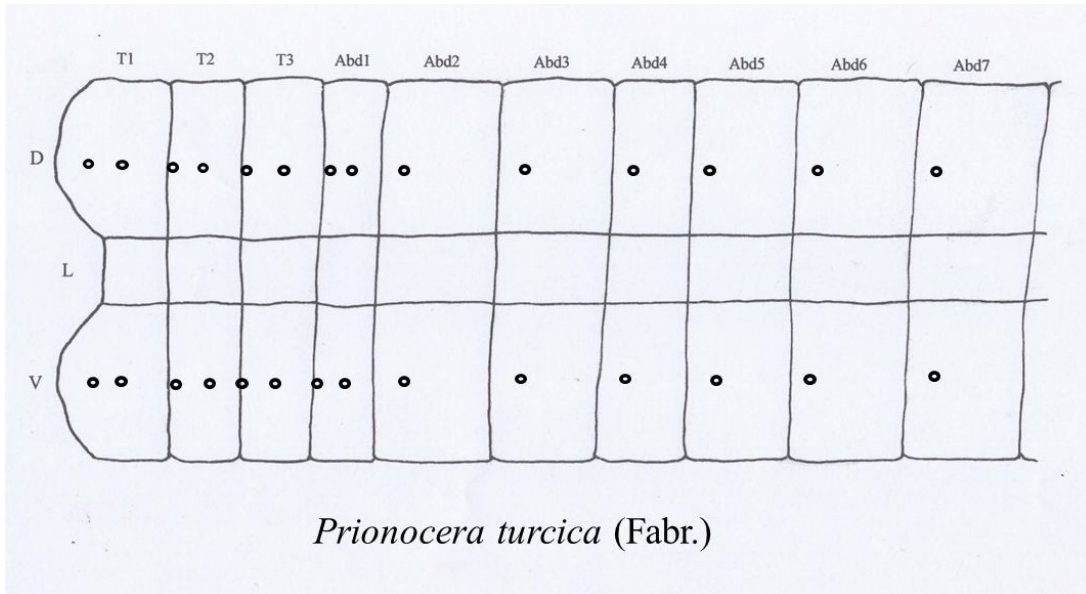


Fig. 2. Schematic diagram of *P. turcica* larva showing position of sensory pegs.

Key to parts: D[orsal], L[ateral]; V[entral]; T1-3 - thoracic segments; Abd1-7 - abdominal segments.

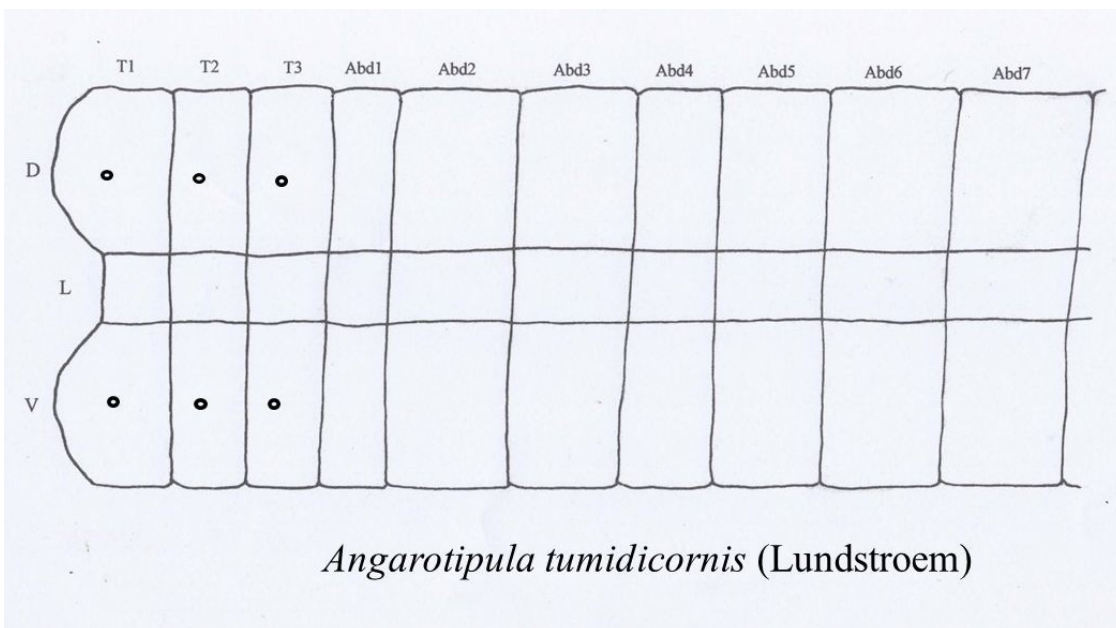


Fig. 3. Schematic diagram of *A. tumidicornis* larva showing position of sensory pegs.

Sensory peg is used as a preferred descriptor. Sensillae as a term covers a number of different forms of tactile organ sometimes combined with chemoreception capacity. The simplest is a trichoid sensillum, a single seta arising from a socket in the integument served by one nerve. It is this type of sensillum that is mapped as referred to above for larval chaetotaxy. They are used widely throughout Diptera in adult and other instars. Sensillae in larval Syrphidae, for example, are of value for both orientation and identifying each segment and can serve as a generic key character (Rotheray, 1993).



Fig. 4. Thoracic segments of *P. turcica* larva from a cleared specimen, sensory pegs indicated by arrows.

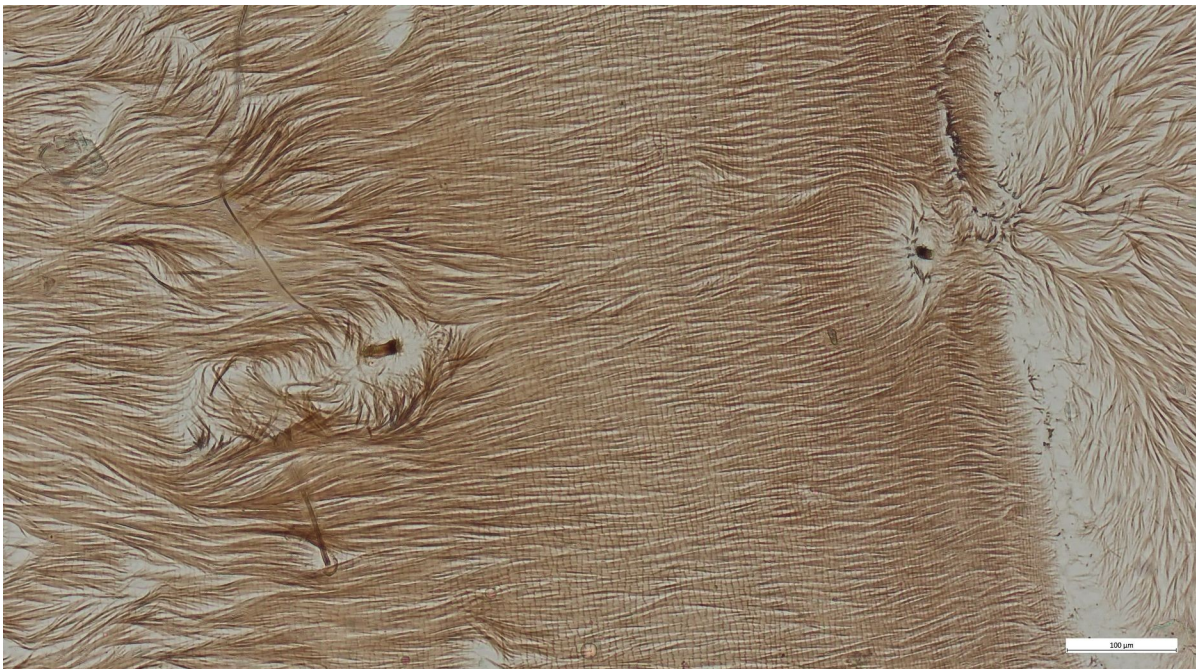


Fig. 5. Detail of a sensory peg of *P. turcica* larva.

In the *Prionocera* and *Angarotipula* larvae the sensory pegs seem to fit within the basiconic sensillae category but further investigation is needed possibly using electron microscopy. Other kinds of mechanoreceptors are recognised in the Tipuloidea such as statocysts (Oosterbroek & Theowald, 1991) that are associated with wet mud-dwelling Limoniidae larvae. Chemoreceptors are widely known, prominent in mouthparts and antennae and often referred to as sensory pits; Wesché (1904) first described various examples.

Both *Prionocera* and *Angarotipula* are fully aquatic each having almost identical anal spiracular fields with elongated papillae and long setal fringes. They inhabit bogs, fens and stream and lake margins. They also bear a vestiture of dense microtrichia, referred to as dense silky pubescence by Chiswell (1956), which imparts defining patterns to the larvae (Brodo, 2018). Within this the sensory pegs protrude from a dendritic base (Fig. 4).

Mechanoreceptors can serve to provide information on contact with the surrounding substrate enabling larvae to remain close to their food supply and be safer from predation. *Prionocera* larvae have been collected from *Shagnum* moss in boggy water margins; those found in Scotland as described above were amongst a dense tangle of roots of the Yellow Flag (*Iris foetida*). A question of the sensory peg functional morphology remains and hence why they are found in addition to setae in *Prionocera* and *Angarotipula* but do not seem to occur in other tipuloid larvae with similar habits. Their presence and absence needs to be contextualised within the Tipuloidea and more widely in Nematocera.

Acknowledgments

The Hunterian Museum for access to photographic equipment; Pojtr Oosterbroek and Herman de Jong (Leiden, The Netherlands) for useful discussion and copies of papers; Fenja Brodo (Ottawa, Canada) for the same and her encouragement to publish a descriptive account. She most generously sent larvae from her own research collection to facilitate this.

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**A minute black scavenger fly (Scatopsidae) taken from
a Common Yellowthroat (Aves: Passeriformes)**

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In addition to my professional interest in flies, I also indulge my fascination with arthropod fauna associated with birds. Sometimes my two interests intersect when Diptera are found on a bird, for example Hippoboscidae (Hribar 2013a,b). On 23 September 2022, in Monroe County, Florida, City of Marathon, Vaca Key, a Common Yellowthroat, *Geothlypis trichas* (L.) (Parulidae), was found dead outside of a building, apparently having died after impact with a window. The bird was washed as described by Hribar and Miller (2011) and recovered arthropods were examined.

The bird was remarkably clean, with only five arthropods found; four feather mites, *Amerodectes hribari* Mironov & Chandler (Proctophyllodidae) (Mironov and Chandler 2017), and one scatopsid midge (Scatopsidae). The midge was placed into a vial and sent to a specialist for identification. After six months the package has not arrived and it is probably safe to assume that the specimen is irretrievably lost somewhere in the international mail. If the specimen ever turns up, and it can be identified to species, another report will be written.

Scatopsidae are a fairly small family and the biology of most species is unknown (Köhler 2010). According to Peng et al. (1992), scatopsids fly during the day, mostly in the afternoon. Scatopsidae may be more common than many people realize. Amorim and Brown (2020) collected eleven species collected in urban environments in and around Los Angeles, California; sufficient material was collected to provide seasonal distribution data for six species. Kozánek and Roller (1997) presented seasonal distribution data for six species in Slovakia.

Scatopsidae have been collected from bird's feathers, birds' nests, and reared from bird feces (Cook 1956, 2007; Krivosheina and Haenni 1986; Kríštofík and Šustek 1995; Okadome and Sasahara 1999; Riley 2000; Matyukhin and Krivosheina 2008; Alonso and Garrido 2009; Lesko and Smallwood 2012; Krivosheina et al. 2018). Haenni et al. (2021) write that a scatopsid was collected with a sample of Hippoboscidae from swallows (*Hirundo* spp.) but it is unclear whether the scatopsid fly was taken from a bird. It is unlikely that the scatopsid was prey for the Common Yellowthroat; Scatopsidae comprised a very small percentage (0.04%) of the total diet of Sand Martins (Vaugh 1979). It is also possible that the scatopsid was being transported by the Common Yellowthroat (Woodroffe 1953).

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Ultraviolet LED lights can be effective tools for Diptera surveys

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When BioQuip closed in March, 2022, the entomological world, at least in the United States, was left without a source for many types of entomological equipment and supplies. This led the senior author and Adam Retzer, an ecommerce businessman whom he had met in 2016 in Sierra Vista, Arizona, to join forces to remedy the vacuum. Retzer, although not an entomologist, had a serious interest in insects and had developed the website, FleaScience, in 2014.

Since the BioQuip fluorescent tube style ultraviolet (UV) lights were no longer available, Retzer and Lingafelter's urgent focus was to develop an alternative collecting light using light-emitting diode (LED) technology that has been improving rapidly during the last 10 years. The gestation of the entolight began in April, 2022. LED strips of 365 and 395 nanometer wavelengths to cover the critical spectrum of UV light attractive to most nocturnal, phototactic insects, were incorporated. Portability, sturdiness, longevity, economy, and effectiveness of the light were the goals in its development. Through many iterations and prototypes, and after exhaustive field testing, the entolight was born by the end of 2022. The entolight weighs less than one pound and is 14 inches long. It is waterproof and can operate perfectly in the rain. It will not break when dropped. The LEDs are designed to operate for thousands of hours without degradation but has built in redundancy of over 230 LEDs so that even if a few diodes fail, the effect is negligible. Each light is built by hand (Fig. 1). Retzer handles the soldering of the light strips and cord (Fig. 1a); Lingafelter (Fig. 1b) does the drilling of the aluminum tube (Fig. 1c) and assembly of the gland end caps (Fig. 1d). The final steps involve adding the waterproof shrink tubing. The completed entolight (Fig. 1e) is shown in operation (Fig. 1f).

In less than five months, entoquip has already sold over 200 entolights and the company is getting positive feedback on entomological finds from researchers around the world. Although the focus of the senior author has been Coleoptera for the past three decades, both authors have been interested in the other orders of insects that are attracted to the entolights. Early results show the entolight to be a very effective as a tool for surveying nocturnal Diptera. We show results of a sampling of flies that were attracted to entolights set up in two locations in Arizona on May 22-23. The first location is a desert habitat, near Vail, Arizona (Pima County) (Fig. 2). Lingafelter collected most Diptera (although not the Tipulidae shown in Fig. 2b), for three hours after dusk on 22 May (approximately 7:30-10:30 PM). A representation of the diversity of Diptera families for this short window of collecting in the driest part of the year in Arizona is shown (Fig. 3). Common families, in addition to Tipulidae, include Sciaridae, Chironomidae, Therevidae, Bombyliidae, Agromyzidae, Tachinidae, Ephydriidae, and Dolichopodidae.

During the same evening and the following evening, entolights were running at the authors' residence in a mixed oak and grassland habitat at the foothills of the Huachuca Mountains, Arizona (Cochise County) and monitored by Woodley. A sampling of the Diptera diversity is shown (Fig. 4). Common families attracted over two evenings during the same period (approximately 7:30-10:30 PM) include Ceratopogonidae, Simuliidae, Stratiomyidae, Sarcophagidae, Tachinidae, Anthomyiidae, Asilidae, and Lauxaniidae.

Lighting is probably not the most important technique for surveying flies, but results show that many families can be attracted, and lighting may be the best method for certain families. Like with Coleoptera, Lepidoptera, and other orders, running lights can sometimes attract some otherwise very rare species that have not been encountered using other collecting methods.

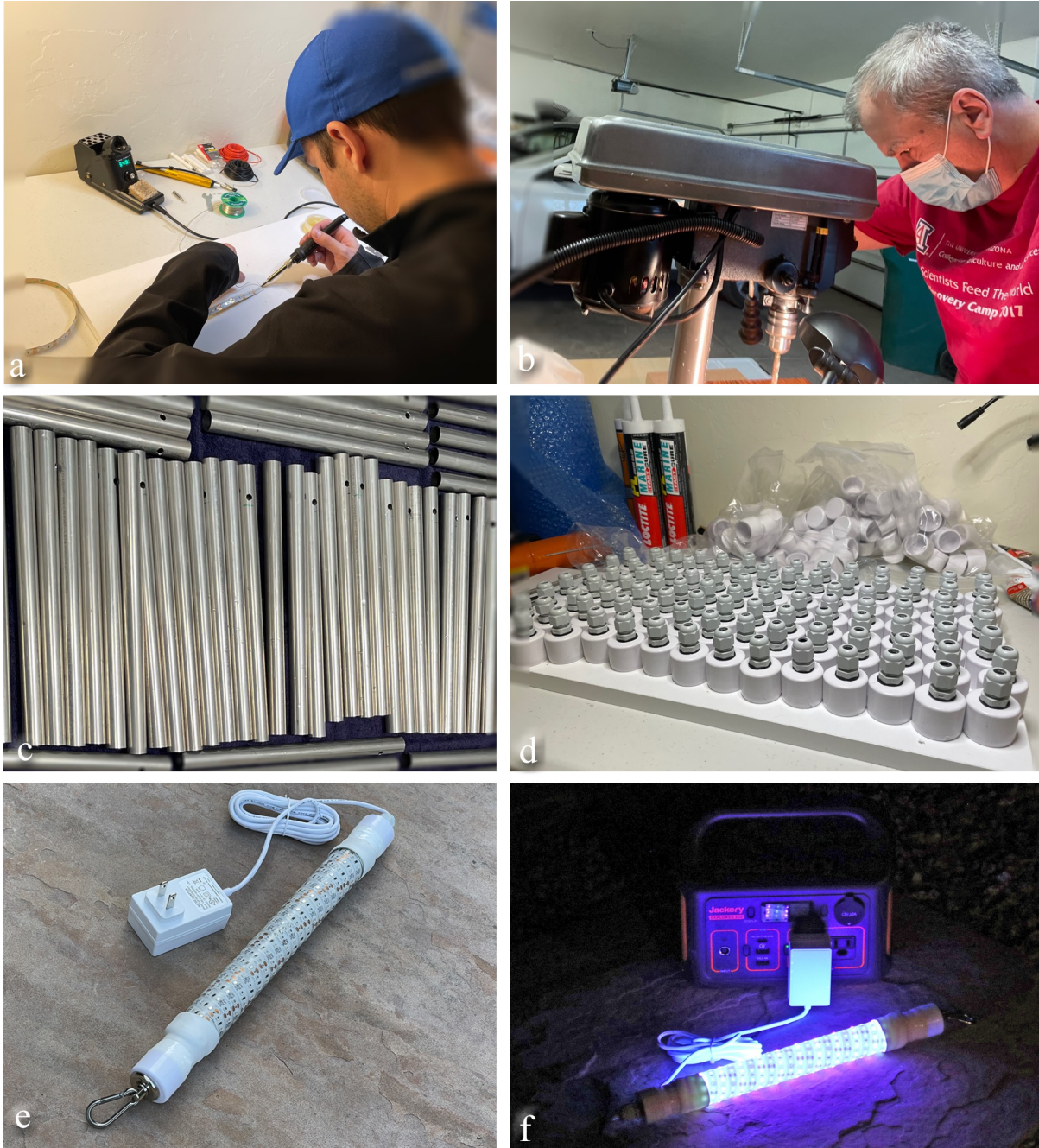


Figure 1. Construction of the ultraviolet LED entolight from entoquip. a) Adam Retzer, cofounder of entoquip, soldering 365 nanometer and 395 nanometer LED strips together; b) Steven Lingafelter, cofounder of entoquip, at his drilling station prepping the end caps and aluminum tubes; c) aluminum tubes drilled and cleaned, awaiting wrapping of LED strips; d) pvc end caps drilled with cable glands attached; e) completed entolight; f) entolight in operation.

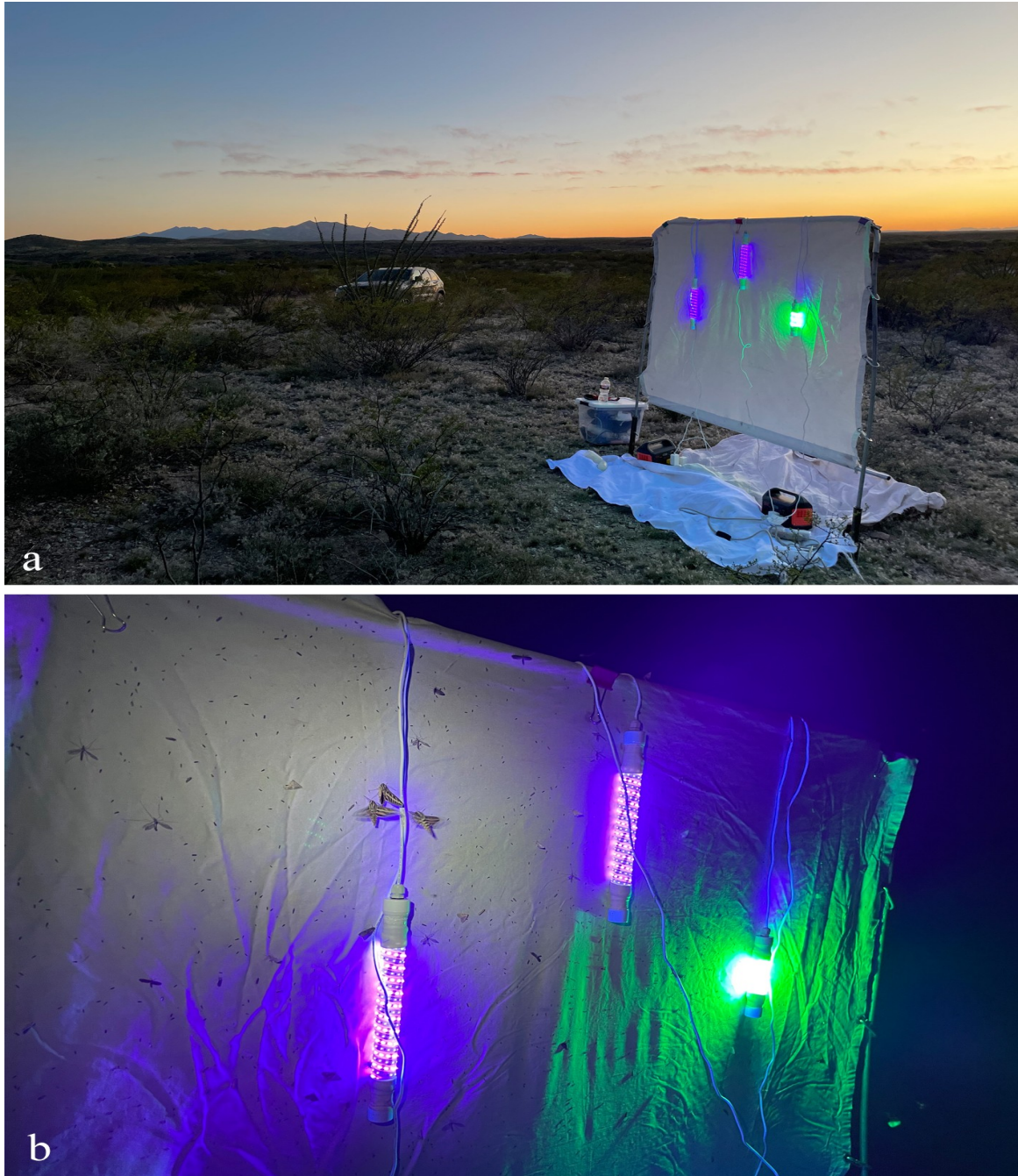


Figure 2. Entolights in operation near Vail, Arizona (Pima Co.). a) white sheet in conduit frame with 2 entolights (365-395 nanometers) and a prototype of a mini-entolight with 520 nanometer LED strips); b) closeup of entolights on sheet showing many insects gathered around the lights, including Diptera (many Tipulidae visible).

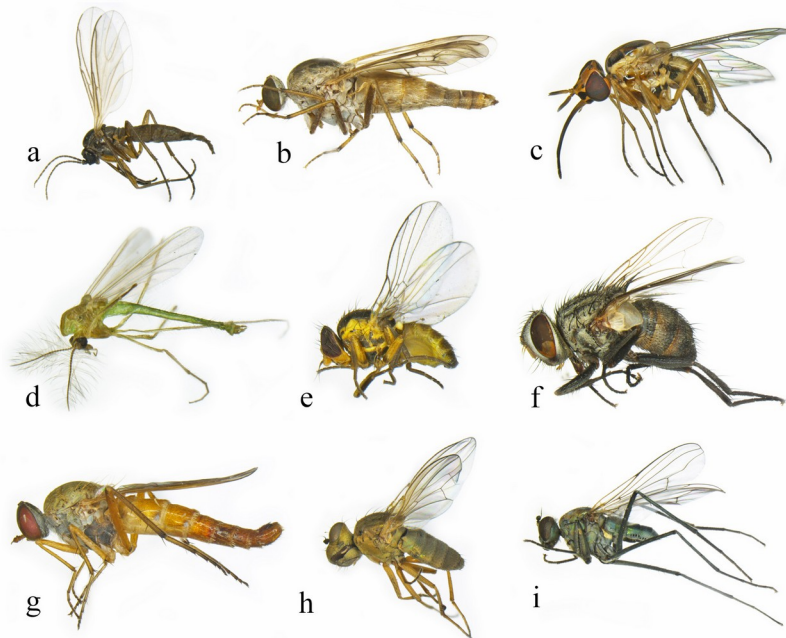


Figure 3. A sampling of Diptera families attracted to the entolights in a 3 hour window (7:30 PM – 10:30 PM) on 22 May 2023 at a desert location near Vail, Arizona (Pima Co.). a) Sciaridae; b) Therevidae; c) Bombyliidae; d) Chironomidae; e) Agromyzidae; f) Tachinidae; g) Therevidae; h) Ephydriidae; i) Dolichopodidae (*Hydrophorus* sp.).

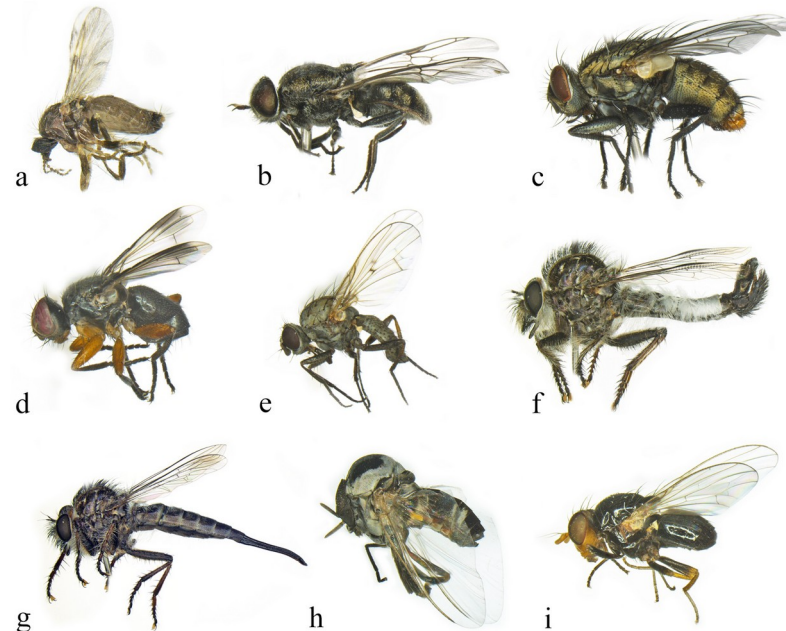


Figure 4. A sampling of Diptera families attracted to the entolights in a 3 hour window (7:30 PM – 10:30 PM) on 22-23 May 2023 at the foothills of the Huachuca Mountains in Hereford, Arizona (Cochise Co.). a) Ceratopogonidae; b) Stratiomyidae (*Adoxomyia* sp.); c) Sarcophagidae; d) Tachinidae (*Catharosia* sp.); e) Anthomyiidae; f) Asilidae (*Efferia* sp., male); g) Asilidae (*Efferia* sp., female); h) Simuliidae; i) Lauxaniidae (*Pseudocalliope* sp.).

Development of a successful education program and disease vector education center at the Anastasia Mosquito Control District, St. Augustine, Florida

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In April, 2003, Dr. Xue was hired as Entomologist at the Anastasia Mosquito Control District (AMCD) to conduct and manage the surveillance and education for the district. When Dr. Xue organized the 1st employee training class, it was surprised that some of the Inspectors / Sprayers could not read a paragraph that contained content on mosquito biology. Dr. Xue realized that the district needed to create and develop an education program which would be the key to assisting the employee success in the field (Xue 2009). Luckily, the director, staff, and Board of Commissioners all supported his proposal about the creation and development of the education program which included employee training, public education, and school programs. The 37 full time employees were divided into three groups (junior 0-3-years' experience, middle 4-10-years' experience, and senior 10-plus years' experience) based on their education, background, and experience and were provided training related to those different areas of experience. Trainings were conducted in small hands-on classes. Also, many different lectures, seminars, and workshops have been provided since 2004.

In May 2005 after Dr. Xue become Director, he requested the Board of Commissioners to create a full time Education and Public Relation Specialist (ES) position to coordinate the employee training, public education, school program, and website/social media platforms. In August 2005, a middle school science teacher Mrs. Gina LeBlanc was hired as the 1st Education Specialist (Fig. 1).



Figure 1. The 1st Former Education Specialists, Mrs. Gina LeBlanc (left), 2005-2009. She has been elected as one of Commissioners since 2016 to serve the District Board of Commissioners. Anastasia Mosquito Control District's 2022 Board of Commissioners (right) who made the decision to build the Disease Vector Education Center in 2021. From left to right: G. LeBlanc, C. Brandhorst, J. Moeller, T. Becker, and G. Gardner.

Since 2005 AMCD has had a total of 8 ES (Table 1). Each one has come to AMCD with a lot energy, new ideas, and different talents and provided different contributions to our education program. Due to continuing education, professional desires or family issues, most of the ES have worked for 2-4 years for the district before leaving. In 2007, the district established the education committee chaired by Director, late by a AMCD Commissioner and created the employee education

fund policy to support employees who want to continue their education. The District education funds and grants have supported/funded four employees who received their Ph.D. through the University of Florida (UF), five employees who received their B.S. or M.S. degrees, and two have received their Associate Degrees. Also, the District has the annual mandatory training for all employees about work place professionalism, hazard communication, interpreting pesticide labels, review of personal protection equipment, biohazard safety, universal waste, and sexual harassment.

Table 1. Served years by each Education Specialist and education committee chair since 2004

Year	Name of Employee	Degree	Committee Chair
Sept 2005-Dec 2008	Gina LeBlanc	B.S. in Biology	Rui-De Xue (2004-2007) & Jeanne Moeller (2007-2015)
Nov 2008- Feb 2011	Adam Holt	M.S. in Entomology	Jeanne Moeller
May 2011- June 2012	Jessica Phillips	M.S. in Environmental Science	Jeanne Moeller
Aug 2012-June 2016	Jodi Scott	M.S. in Entomology, changed to Ph.D. student	Jeanne Moeller
June 2014- June 2019	Chris Bibbs	M.S. in Entomology, changed to Biologist / Ph.D. student	Jeanne Moeller
Feb 2017- Mar 2019	Molly Clark	B.S. in Wildlife	Jack Rock
May 2019-Aug 2021	Edward Zeszutko	B.S. in Wildlife	Trish Becker
Oct 2021-present	Taylor Ballantyne	M.S. in Public Health	Trish Becker

For professional training in our region, AMCD has cooperated with USDA/Center for Medical, Agriculture, and Veterinary Entomology (CMAVE), Gainesville, Florida (Xue et al. 2016) to organize annual arbovirus surveillance and mosquito control workshops since 2004 (Xue et al. 2014). From 2016-2023 the workshops were in conjunction with the Florida Mosquito Control Association (FMCA)’s Northeastern Region member meeting and the National NE1443 regional project annual meeting (2016-2019). The District selected/collected and published the workshop presentations in Technical Bullet of the Florida Mosquito Control Association for 4 volumes (2006, 2008, 2013, and 2016). AMCD also hosted the Society of Vector Ecology’s annual meeting in 2012, organized symposia about pyrethroid insecticide products and EEE/WNV response in 2012. AMCD hosted the FMCA annual meeting in 2015 & 2019, FMCA Fly-In class in 2022, and Florida Entomological Society’s annual meeting in 2018. AMCD collaborated with USDA/CMAVE to organize the GIS and modelling workshop in 2006, with the CDC to organize the insecticide resistance workshop in 2009, and AMCD hosted the international working group meeting about areawide genetic control of vector mosquitoes in 2013 and CDC biologist training for surveillance in May 2018 (Fig. 2). Over the years, AMCD has sent more and more employees to join state and national meetings and professional training program on an annual basis.

Due to many trainings and the promotion of education for professionalism, the District has slowly changed the team structure with higher educated employees. Currently, AMCD has five Ph.D., six M.S., and six B.S./A.A in the 32 full time employees. In addition, the District has trained post-doctoral fellows, visiting scientists, and many intern students since 2006 (Xue et al. 2015). The visiting scientists and intern students have benefited AMCD applied research, operation, and education programs. AMCD’s public education program includes giving presentations to our local professional and civic associations, different clubs, home owner associations, attending local events, teaching at different schools (Fig. 3) and hosting science exploring classes, organized field trips and tours of AMCD facilities. The District has increased its presence on social media steadily since 2011. AMCD utilizes Facebook and has more than 1,000 followers (Fig. 4).



Figure 2. Left: CDC/AMCA/AMCD trained for certification of educators for Integrated Mosquito Management in 2018. Right: CDC attendances for visiting and training for surveillance at AMCD in May 2018.

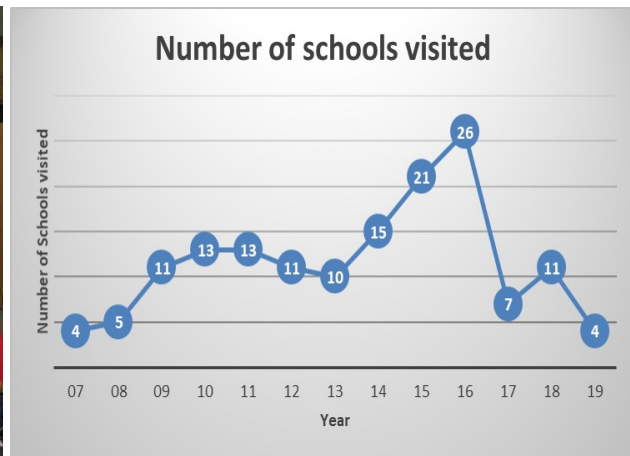


Figure 3. Left: School presentation and teaching at YMCA. AMCD's 1st Education Specialist Gina LeBlanc (left standing) and her students in 2006. Right: number of schools in St. Johns County visited by AMCD from 2007 to 2019.

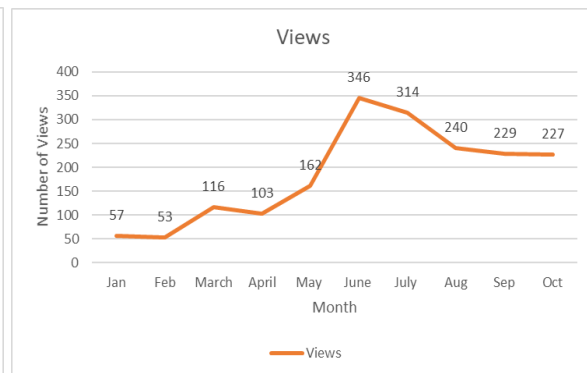
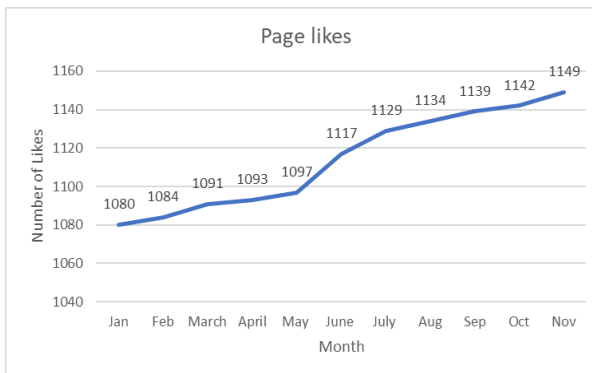


Figure 4. Links and views of AMCD's social media (Facebook) in different months in 2019.

In an effort to increase awareness of mosquito control activities among St. Johns County residents, spray and response to service requests maps are created in real time then, published on the District's website. The District is also frequently featured in St. Augustine's local TV, radio, and newspapers.



Figure 5. Top left: Original idea from visiting Jiangsu CDC pest and vector gallery in May 2017, from left: Ming-Hao Zhou (Jiangsu CDC Director), Uli Bernier (USDA National Program Leader), James Clauson (Beach Mosquito Control District Director), Rui-De Xue (AMCD Director), Daniel Strickman (Gates Foundation Office), Hong-Liang Chu (Director of Institute of Vector-borne Disease, Jiangsu CDC) . Top right: Dr. Xue with their mosquito sculpture. Bottom: Current front outlook of the AMCD Disease Vector Education Center with 12 sections (marsh habitants, life cycles and rearing, specimens of mosquitoes, diseases transmitted by mosquitoes and other vectors, ticks and tick-borne diseases, class room, operation control tools included ULV truck and helicopter, surveillance tools and new technology, other insects and honey bees & butterfly provided by the Division of Plant Industry, AMCA, FMCA and AMCD's history, and outdoor children play ground, and outdoor garden with a bat house, a pool, and many flowers and plants).

In May 2017, a group of people (Fig. 5) from the U.S.A. visited Jiangsu CDC's pest and vector gallery and other related collections/displays of disease vectors for education and outreach purposes during the 6th International Forum for Surveillance and Control of Mosquitoes and Vector-borne Diseases in Nanjing, China. Their education facilities were very impressive which resulted in the idea to have an AMCD education facility as a part of AMCD's new control and research campus. The Board of Commissioners was presented the idea of the education facility, and gained their permission to further explore this idea. The former ES Molly Clark and Dr. Xue visited several CDC's Pest and Vector Education facilities, and other related biological and zoological museums in Nanjing, Wuxi, Hangzhou, and Beijing, China. We brought many ideas, pictures and developed an outline for the Board for further consideration. AMCD appointed a specific committee including

former AMCD Commissioner, Mrs. Mary Willis and former Director Mr. Hampton J. Mickler, St. Johns County Department of Health Director Dr. Dawn Allicock, County Agricultural Extension Director, Mr. Tim Wilson, Florida Department of Environmental Protection's Education Center Director Dr. Michael Shirley, St. Johns County School Board Superintendent, Mr. Tim Forson, University of Florida's Department of Entomology & Nematology's Chairman, Dr. Blair Siegfried, Urban Entomological Professor, Dr. Phil Koehler and Extension Professor, Dr. Rebeca Baldwin, Florida Department of Agricultural and Consumer Service/Division of Plant Industry (DPI) Bureau Chief, Dr. Leroy Whilby, CDC's Branch Chief Entomologist, Dr. Roxanne Connelly, USDA/CMAVE's Director, Dr. Kenneth Linthicum, and Bill and Melinda Gates Foundation Office, Dr. Daniel Strickman, and Florida Technology University's history Professor, Dr. Gordan Patterson. AMCD held several public meetings with school boards and related local agencies, and gave many presentations at local clubs and organizations. AMCD also held the committee meeting in the Division of Plant Industry (DPI), and Florida Museum of Natural History in UF campus, Gainesville. Then AMCD collaborated with the design and construction company to work out the preliminary design (Fig. 5) and finally the Board approved construction to begin in late 2020. The Disease Vector Education Center (DVEC) facility is anticipated to be completed by late 2023 with the interior exhibits already in development. Due to local political influence in 2019 and 2020, the original proposed name "Museum of Disease Vectors" has been changed to "Disease Vector Education Center".

So far, the District has trained 4 Ph.D. students through the University of Florida, 88 intern students, and 21 visiting scientists worldwide, and certified 108 educators for integrated mosquito management in 2017 & 2018. AMCD provided more than 380 continuing education credits to public health pest control license holders through annual workshops, symposia, seminars, and different professional meetings. AMCD has been recognized as one of the American Mosquito Control Association (AMCA)'s ten training hubs in 2017 & 2018 (Fig. 2), and AMCD provided surveillance training to CDC biologists in May 2018 (Fig. 2). AMCD has been a mentor organization providing training for small mosquito control programs awarded by the National Association of the City and County Health Offices (NACCHO) in 2019 & 2020. AMCD has eight MoU's with different Universities to train their intern students, and AMCD has been an intern student training site for the CDC Southeastern Center for Excellence in Vector-borne Diseases (Xue & Qualls 2022). Also, AMCD accepted and provided summer intern training for high school students (4 students each year) who are in the Academy Career program for Biotech and Medicine since 2021. AMCD was nominated and recognized as one of the best business partnership from the St. Johns County's School Board in October 2022. Recently, AMCD has been recognized/awarded as an intern training host by the Entomological Society of America. AMCD has been recognized as the Northeastern Florida mosquito control, applied research, and education center.

Contact information: Rui-De Xue is AMCD's Director at rxue@amcdf.org; James Richard Weaver is AMCD's Business Manager at rweaver@amcdf.org; Whitney A. Qualls is AMCD's Scientific Manager at wqualls@amcdf.org; 120 EOC Drive, St. Augustine, FL 32092; (904) 471-3107; www.amcdsjc.org.

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Failed trials of potential *Drosophila* attractants

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During the past couple of years I've been making collections of *Drosophilidae* in my back yard (Hribar 2020a, b, c; 2021). I have been trying different baits as time and interest permits. I provide here a list of collections that I made with some potential attractants that yielded little with one exception (Table 1). The first four collections were made with the same bottle trap that I used previously. The last five were made with a slightly modified design (Figure 1). Some explanatory notes are provided below the table.

The Fernet Branca was taken from a sealed bottle. The four essences were purchased at a supermarket and taken from sealed bottles. The vodka and Lambrusco wine were taken from bottles that had been opened previously. The urine was collected immediately prior to placement in the bottle trap.

With the exception of the human urine, all of the potential attractants contained ethanol in varying concentrations. Ethanol itself has been reported to be both attractive (Azanchi et al. 2013) and repellent (Jaenike 1982) to ovipositing female *Drosophila*. Ethanol is, however, attractive to bark beetles as it is secreted by stressed trees (Kelsey et al. 2014). Jaenike (1982) and Galland et al. (2020) both reported that peppermint oil was repellent to *Drosophila*. Lambrusco is a variety of red wine that is produced in the Province of Emilia-Romagna in Italy and it has a specific chemical composition (Papotti et al. 2013, D'Amico et al. 2018). Das and Shah (2011) mention that observations were made in India as early as 1500 BC that flies were attracted to the urine of people suffering from a certain disease, now suspected to be Type 1 diabetes. Rose et al. (2015) provide a good review of human urine production and composition. Urine is comprised mainly of water and contains nitrogen, carbon, potassium, and phosphorus. Fernet Branca is an amaro, a bitter herbal liqueur believed to promote digestion (i.e., a digestif). The Fernet Branca recipe is a closely guarded trade secret and includes at least 27 and perhaps



Figure 1. Slightly modified bottle trap.

over 40 ingredients, said to include saffron, cinchona bark, aloe, bitter orange, myrrh, and chamomile (Wilson 2010). (One indication of the alcohol content and aromatic odor of Fernet Branca is that it is an ingredient in a variation of a cocktail called The Corpse Reviver; sources differ whether it is properly called the Savoy Corpse Reviver, The Corpse Reviver #3, or The Corpse Reviver #4.)

Table 1. Drosophilidae collected with various baits.

Potential Attractant	Date	Insects Captured
Fernet Branca	2022, otherwise unrecorded	None
Vodka	2022, otherwise unrecorded	1 bark beetle
Human Urine	10-12 October 2022	8 Drosophilidae
Human Urine	15-18 November 2022	4 Drosophilidae
Lambrusco wine	11-12 May 2023	37 Drosophilidae (8 <i>repleta</i> group; 1 African Fig Fly, <i>Zaprionus indianus</i> ; 28 other Drosophilidae)
Vanilla essence	13-14 May 2023	4 Drosophilidae
Almond essence	14-15 May 2023	None
Peppermint essence	15-16 May 2023	None
Coconut essence	16-17 May 2023	1 <i>repleta</i> group, 2 other Drosophilidae

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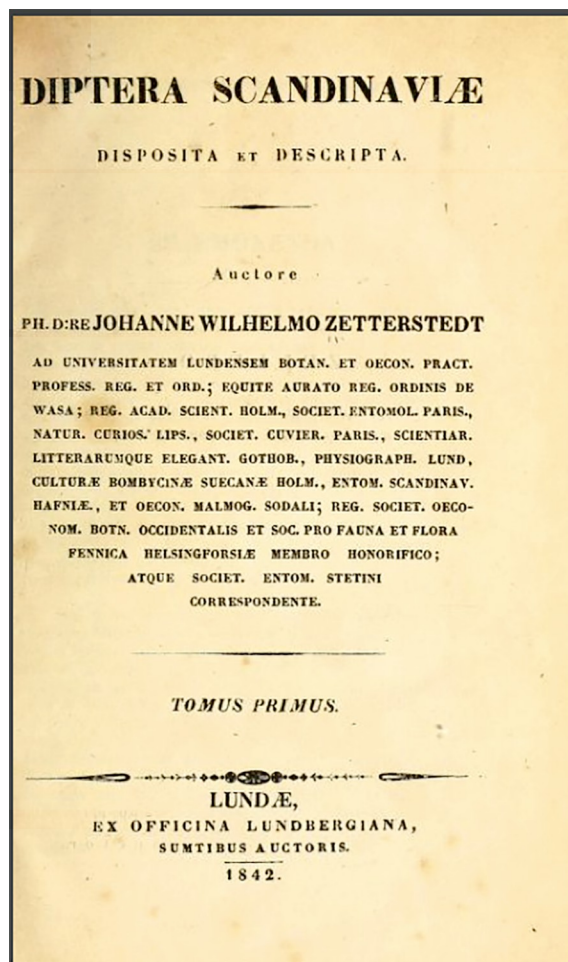
HISTORICAL DIPTEROLOGY

Zetterstedt's *Diptera Scandinaviae* (1842-1860) — revised dates of publication

Neal L. Evenhuis

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Johann Wilhelm Zetterstedt (1785-1874) was appointed in 1812 to the botany faculty at the University of Lund, but he had more interest in insects and spent most of his subsequent years at Lund publishing on them. Some of his earlier travel accounts did not receive positive reviews and they were said to have lacked scientific qualities and had been sprinkled with poetry (a collection of his poetry was published in 1866). But he is best known in dipterology for his *Diptera Scandinaviae*, a monumental 14-volume work spanning the years 1842–1860) and filling more than 6,600 pages. He might have continued on with the work, but an accusation of sodomy and the resulting newspaper accounts making his name almost a joke (Holmqvist 2022) appeared to have hastened his retirement (Anonymous 1853). Despite this unfortunate setback to his career, three volumes of *Diptera Scandinaviae* appeared after 1853, but there is a noticeable decrease in the speed of publication (most previous to 1853 came out every year).



Evenhuis (1997) gave dates of publication for all the volumes (previous to this, only the year was known). Since then, an error in citation of one of the volumes and better dating for eight of the 14 volumes have led me to present the following revised list of dates of publication for this work.

The table below presents the revised dates in the last column with a source for each date (those in red are earlier than previously known. The minutes of the meetings of the Svensk Vetenskapsakademien was often the best source for dates, but not always. The first notice of the work appeared in the publisher's recording journal *Swensk Bibliographi* (later *Svensk Bibliographi*). Other dates from Evenhuis (1997) could not be improved upon, but two of the last three volumes curiously had dates from the German publisher's recording periodical *Allgemeine Deutsche Bibliographie* that were earlier than those in Swedish periodicals noticing the work.

Volume	Pages	LTD date	Revised date (source)
I	i-xvi, 1-440	< 6 Sep 1842	Jul 1842 (Swensk Bibliographi)
II	441-894	2 May 1843	2 May 1843 (Ent. Ver. Stettin)
III	895-1280	[error in dating]*	April 1844 (Swensk Bibliographi)
IV	1281-1738	11 Jun 1845	11 Jun 1845 (Svensk Vetenskapsakad.)
V	1739-2162	3 Sep 1846	Jul 1846 (Swensk Bibliographi)
VI	2163-2580	9 Jun 1847	9 Jun 1847 (Svensk. Vetenskapsakad.)
VII	2581-2934	13 Sep 1848	13 Sept 1848 (Svensk. Vetenskapsakad.)
VIII	2935-3366	12 Sep 1849	12 Sep 1849 (Svensk. Vetenskapsakad.)
IX	3367-3710	31 Dec 1850+	11 Sep 1850 (Svensk. Vetenskapsakad.)
X	3711-4090	31 Dec 1851+	8 Oct 1851 (Svensk Vetenskapsakad.)
XI	4091-4545	10 Mar 1852	10 Mar 1852 (Svensk. Vetenskapsakad.)
XII	4547-4942	Jul-Dec 1855	4 Oct 1855 (Allg. Dtsch. Biblio.)
XIII	4943-6190	> 1 Sep 1859	12 Oct 1859 (Svensk. Vetenskapsakad.)
XIV	6191-6609	12 Dec 1860	11 Oct 1860 (Allg. Dtsch. Biblio.)

*Evenhuis (1997) mistakenly listed this volume as published in two parts appearing between March 1844 and April 1845. O'Hara *et al.* (2011) noticed the error and corrected the citation.

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Sixto Coscaron
August 6, 1926–January 6th, 2022

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On January 6th, 2022, Dr. Sixto Coscaron passed away in the city of La Plata, Argentina, at the age of 95. Sixto was born on August 6, 1926, in the city of Cipolletti, in the province of Rio Negro. Soon after, his parents settled in the town of General Fernandez Oro (Rio Negro), a small rural town in the Alto Valle del Rio Negro. The Coscaron family were among the first settlers in the town. At the age of 13, Sixto had to move to the city of Bahia Blanca (Buenos Aires province) to attend high school. After completing high school, he enrolled in the Faculty of Natural Sciences and Museum of the National University of La Plata. He obtained his degree in Biology and later in 1951, he obtained his doctorate in Natural Sciences.

Passionate about the biological sciences, he continued his studies and in 1954, he obtained a degree in Clinical and Industrial Bacteriology from the Faculty of Veterinary Sciences at the National University of La Plata. Dr. Coscaron was a renowned expert in medical entomology. He was passionate about fieldwork and meticulous when in the laboratory. He conducted detailed and passionate research on the group of Diptera, especially the Simuliidae and Tabanidae families, dedicating himself to the biodiversity and Neotropical taxonomy. He carried out his research both in the country and abroad, including countries such as the USA, Canada, Brazil, Mexico, Chile, and Colombia. Through his tireless scientific work, he made significant contributions, especially in the field of Entomology, which resulted in more than 150 scientific publications, and he authored numerous books, book chapters, and refereed journals. He also presented more than 50 papers at congresses and symposia.



In his long career, he obtained scholarships to carry out taxonomic studies of Simuliidae and Tabanidae, four of them in the USA: Guggenheim (USA) (1963-64), NIH (USA) (1965), NSF (USA) (1969-1970), Fulbright (USA) (1976), and FAPESP (Brazil) (1979). In 1979, Dr. Sixto Coscaron created CEPAVE (Center for Parasitology and Vectors), which he directed until 1984. The creation of this study center was driven by the need to have laboratories for the development of the tasks of young researchers, have the appropriate instrumentation, and develop projects related to arthropods of health or economic interest.

Another of his passions was teaching, which he began while still a student in 1948 as a Teaching Assistant at the University of La Plata and then at the University of Buenos Aires, holding various positions both nationally and internationally until he became a Full Professor. From 1970, he was the director of 65 scientists (nationally and internationally) who obtained their doctorates or scholarships and who have since been and are internationally recognized.

His scientific work was recognized with various awards, including the Angel Gallardo (1967) from the National Academy of Exact, Physical, and Natural Sciences, Alexandre Rodriguez Ferreira, 1984-1987 from the Brazilian Academy of Zoology, and in 2003, the Konex Award for being among the best researchers of the last decade.

He held numerous positions as a researcher, reaching the highest category of CONICET as Senior Researcher in 1992. He also held 22 honorary positions in both the National Council for Scientific and Technical Research (CONICET), the CIC (Council of Scientific Research), and the National Universities of La Plata and Buenos Aires.

Dr. Coscaron was a man passionate about entomology, to which he dedicated his entire life, both in the laboratory, field work, and academic activity. As a result of his dedication to Entomology, he left us with a scientific work of incalculable value. He approached all the tasks he undertook with the same enthusiasm and scientific seriousness, which allowed him to become a world authority in his area of work.

To conclude this remembrance, it only remains to mention that Sixto was a family man who was always accompanied by his beloved wife Carmencita and was always willing to help anyone who asked for advice. Sixto will be remembered with affection and admiration by his children, grandchildren, and disciples.

Inside and Outside Dipterology

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Two dipterologists born in the same, small upstate New York town of Gloversville typify the inside and outside of dipterology. C. P. Alexander was born September 25, 1889, in Gloversville. His home on Poole Ave. was only a walking distance from where John G. Stoffolano, Jr., was born on Dec. 31, 1939, on 52 Orchard St. Alexander focused on crane flies, mainly using external features or characters of the adults. As far as is known, Alexander in his 11,000 species and genera publications never ventured into what was inside, or the internal anatomy, of the adult crane flies while John Stoffolano mainly focused on the internal or physiological aspects of the adults.



Two dipterologists born in the same small town of Gloversville, New York. Left: Charles P. Alexander (with his wife Mabel). Right: John G. Stoffolano, Jr.

They never knew one another until Stoffolano joined the Department of Entomology at the University of Massachusetts in September 1969, where Alexander was professor emeritus in the department. From then on, both fly people had contact and shared stories about growing up in Gloversville. Stoffolano remembers C.P. telling him how, as a teenager, he was interested in both birds and crane flies. In fact, C.P. published a paper on the birds of Fulton County. He also related the story about how he wanted to know more about the identification of all the crane fly adults he had pinned in a cigar box. To find out more information about these, he took the trolley to Albany to see the state entomologist E. P. Felt. To his surprise, he was told that no one knew anything about them. On his way back to Gloversville, C.P. made the decisive decision that he would be the one that would

know more about this group of flies than anyone else and he did. In 1910, he wrote a paper on the crane flies of Fulton County.

In Amherst, Massachusetts, C.P. and his wife Mabel built onto their home an addition known as Crane Fly Haven. Stoffolano went to high school with Linda Miller who was Mabel's niece, but John never discussed this connection with Linda. Stoffolano vividly remembers taking a birthday cake to C.P. on his 89th birthday. He was also instructed by C.P. to bring a movie projector because he and Mabel had just received a short movie on a stonefly nymph that was given the species name after Mabel by a Canadian entomologist. John distinctly remembers how excited and enthusiastic both Alexanders were at their age to see the video in honor of Mabel. One should also know that Mabel always provided C.P. with a cup of coffee when he went into his research addition to name a new species. Also, during all their crane fly forays in the U.S., Mabel did all the driving. At graduation, C.P. would always have his field clothes under his gown so that he would be ready to depart with Mabel on another collecting trip. I encourage dipterists to read the excellent and detailed account of one of our most distinguished dipterist (Wheeler 1985).

On the flip side, or let's say inside of the adult flies, Stoffolano focused on what is going on inside the fly. John just retired on Dec. 28, 2022 after 53 years at the University of Massachusetts and has made some important discoveries with respect to what is inside the fly or fly physiology. His close contact with Lloyd Knutson, both in the U.S. and in Italy, resulted in two papers devoted to external structures of Sciomyzidae (Stoffolano *et al.* 2013, 2015). Stoffolano, working with 2 dipterists (Borkent and Woodley), showed that the absence of abdominal plaques, based on internal TEM of several dipteran adults in the Muscomorpha (Cyclorrhapha), and postulated it was a synapomorphy for this group of flies and correlated with their immobile pupa and different mode of emergence (Stoffolano *et al.* 1988). Later Stoffolano was instrumental in changing the idea about the original function of the adult diverticulated crop from one of only storage to that involving sugar regulation, involvement in the regurgitation process, and its significance as an organ involved in storage and passage of pathogens of diseases of humans and domestic animals (Stoffolano 2019, 2022; Stoffolano & Haselton 2013).

Stoffolano strongly believes that more research needs to be done on all aspects of various dipteran internal structures. He distinctly remembers dissecting face fly adults while at Cornell looking for the presence of ovaries in diapausing flies when he accidentally discovered a new species of nematode. He also remembers a former student, Reginald Coler, and his research in Stoffolano's laboratory at UMass on face fly nematodes. It was Reggie's dissection of adult house flies at the University of Florida that led to the accidental discovery of the salivary gland hypertrophy virus in adult HF (Coler *et al.* 1993).⁸ The important point to be made here is that these 2 discoveries would not have been made without looking inside the fly. dipterists need to make more ventures into the inside of the fly, especially wild flies. Stoffolano believes that only then will we discover many new involvements of internal organs and new pathological effects. The Diptera offer a tremendous source of undiscovered information in such a diverse group. As dipterists, we cannot relinquish all new discoveries to the *Drosophila* researchers. Also, we must focus on field studies and not rely on laboratory model fly systems that conceal many important discoveries yet to be made.

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PHILAMYIANY

Diptera on stamps (5): Glossinidae

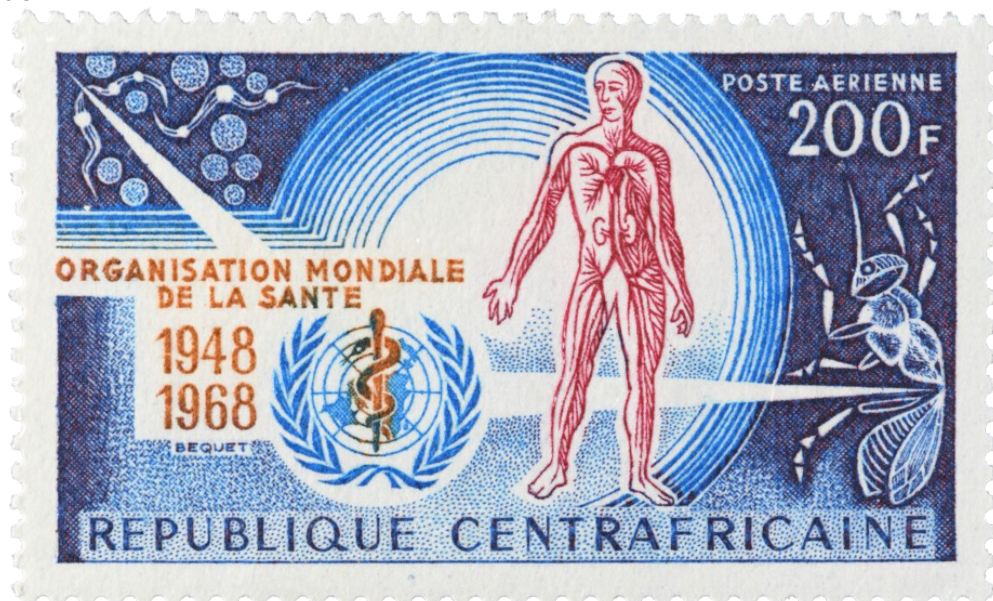
Jens-Hermann Stuke

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The fifth contribution to "Diptera on stamps" deals with Tsetse flies (Glossinidae), a small but well-known family. Glossinid adults feed on the blood of vertebrates such as humans, and the genus *Glossinia* is vector of human sleeping sickness (Trypanosomiasis). Due to their huge medical impact in the Afrotropical Region it is not surprising that *Glossinia* is a comparatively common fly found on stamps – only *Anopheles* is found more frequently. Almost all stamps showing *Glossinia* are from sub-Saharan countries affected by sleeping sickness, with one stamp from Poland being the only exception. Stamps from Cameroon, Gabon and Burkina Faso honour the French physician Eugène Jamot (1879-1939) who first recognised *Glossinia* as the vector of sleeping sickness in Cameroon. The Cameroon stamp from 1971 shows the earlier stamp from 1954 and is therefore one of the very few stamps depicting a stamp with a fly on it. Other stamps explain the distribution of *Glossinia*, illustrate the life cycle of trypanosomes or show how to prevent infection. Education is often an additional function of stamps. There are about 23 species of Glossinidae, all belonging to genus *Glossinia*, but in most cases the *Glossinia* depicted on stamps are not identified to species level.

For each stamp I have provided the country and year of issue, title of stamp, title of stamp series (where available/relevant), face value, Michel number and stamp number (the latter both copied from <https://colnect.com/>).

Glossinidae



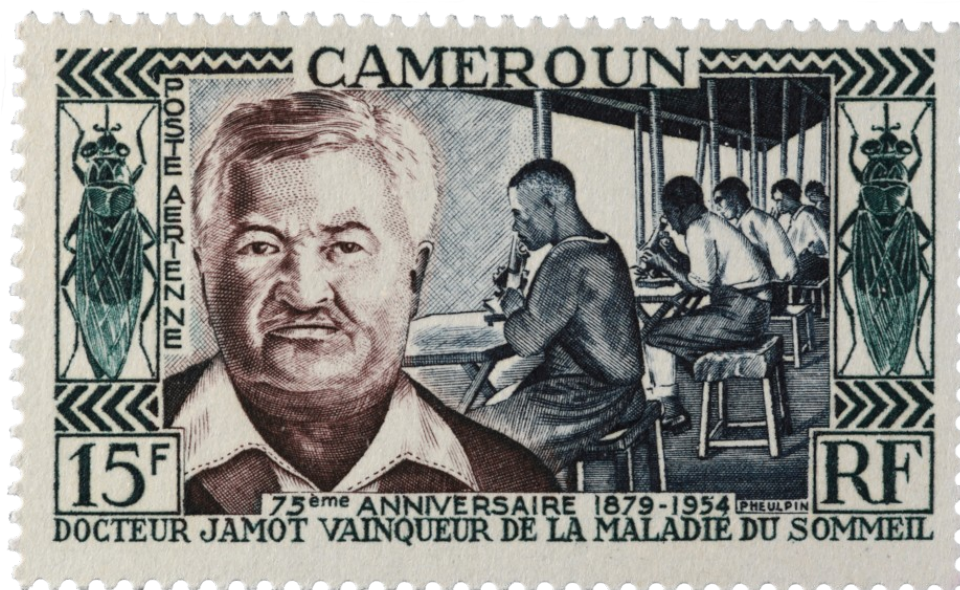
***Glossinia* spec. – Central African Republic 1968:** Organisation Mondiale de la Sante, 1948, 1968, 200 Central African CFA franc. – Michel number: CF C53; stamp number: CF C53.



Glossinia spec. – Burkina Faso [Upper Volta, 1958-1984] 1979: 100° Anniversaire de la naissance de d'Eugène Jamot, vainqueur de la maladie du sommeil, 55 West African CFA franc. – Michel number: BF 778; stamp number: BF 524.



Glossinia spec. – Cameroon 1979: 100eme Anniversaires de la Naissance du D'Eugene Jamot, Vainqueur de la Maladie du Sommeil, 50 Central African CFA franc. – Michel number: CM 913; stamp number: CM 659.



Glossinia spec. – **Cameroon 1954:** 75ème Anniversaire 1879-1954, Docteur Jamot Vainqueur de la Maladie du Sommeil, 15 French franc. – Michel number: CM 305; stamp number: CM C33.



Glossinia spec. – **Cameroon 1971:** Philatecam 1971, 25 Central African CFA franc. – Michel number: CM 662; stamp number: CM C172.



Glossinia spec. – Chad 1978: 1978 Journée nationale de la salubrite, 60 Central African CFA franc.
– Michel number: TD 840; stamp number: TD 358.



Glossinia spec. – Chad 2010: 10 Ans de lutte contre la Trypanosomiase en Afrique, 150 Central African CFA franc. – Michel number: TD 2515; stamp number: TD 991.



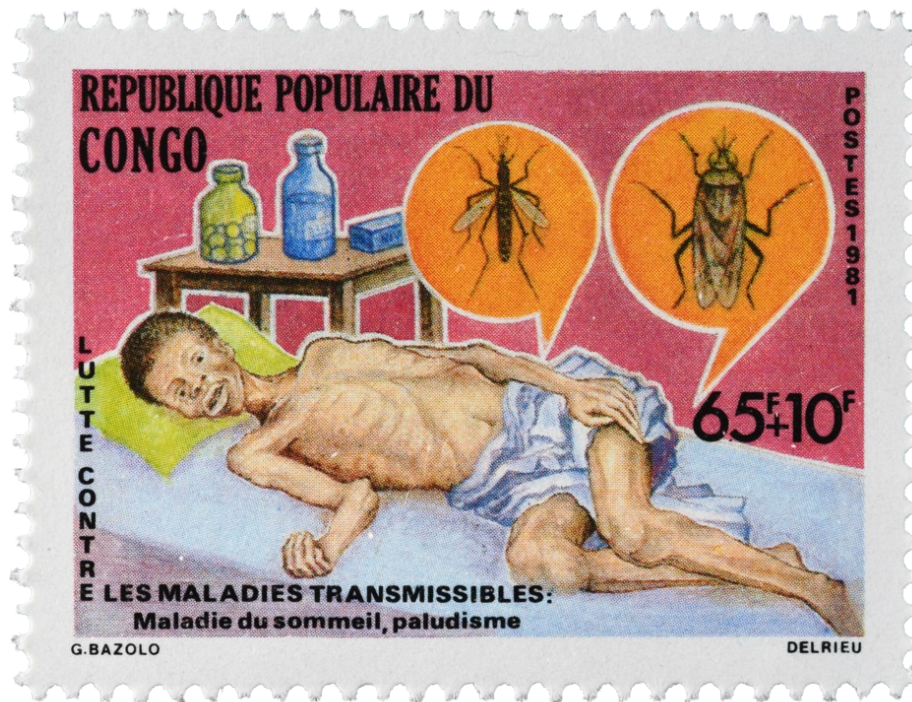
Glossinia spec. – Chad 2010: 10 Ans de lutte contre la Trypanosomiase en Afrique, 300 Central African CFA franc. – Michel number: TD 2516; stamp number: TD 992.



Glossinia spec. – Chad 2010: 10 Ans de lutte contre la Trypanosomiase en Afrique, 350 Central African CFA franc. – Michel number: TD 2517; stamp number: TD 993.



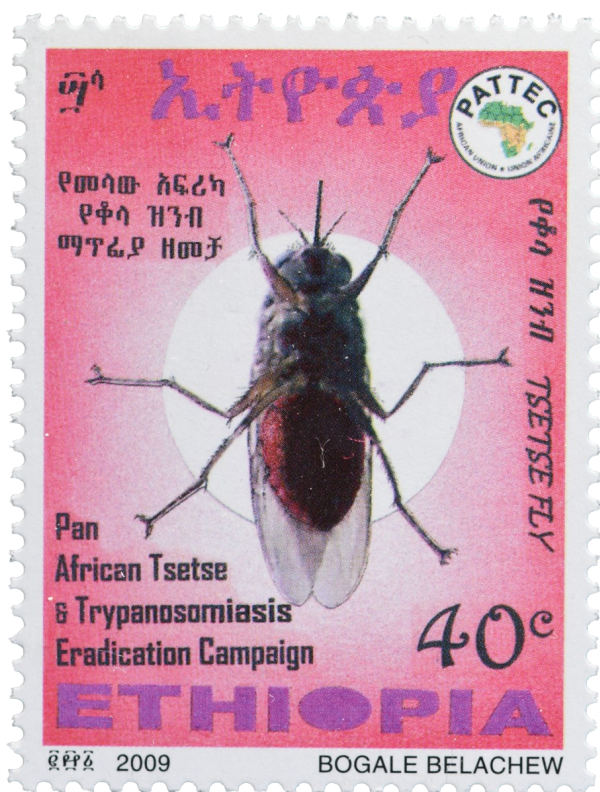
Glossinia spec. – Chad 2010: 10 Ans de lutte contre la Trypanosomiasse en Afrique, 550 Central African CFA franc. – Michel number: TD 2518; stamp number: TD 994.



Glossinia spec. – Congo 1981: Lutte contre les maladies transmissibles: Maladie du sommeil, paludisme, 65+10 Congolese franc. – Michel number: CG 820; stamp number: CG B6.



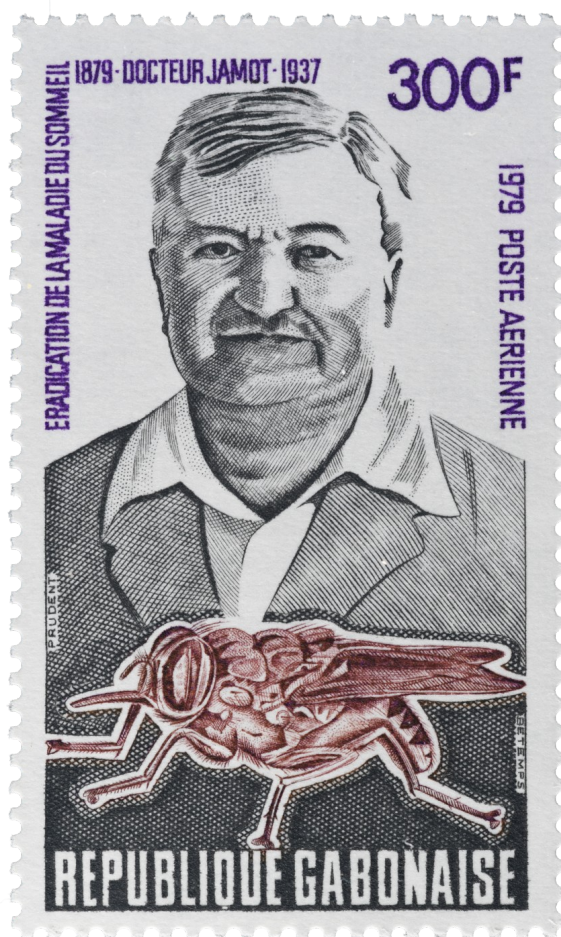
Glossinia spec. – Ethiopia 2009: Pan African Tsetse & Trypanosomiasis eradication campaign, 3 Ethiopian birr. – Michel number: ET 1867; stamp number: ET 1731.



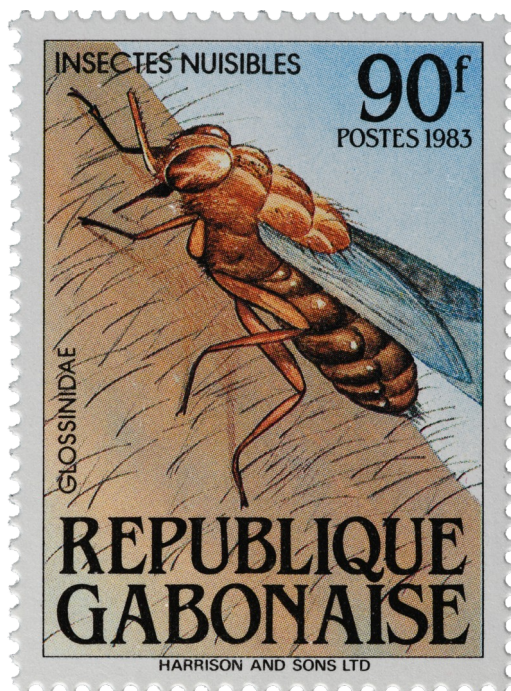
Glossinia spec. – Ethiopia 2009: Pan African Tsetse & Trypanosomiasis eradication campaign, 40 Ethiopian cent. – Michel number: ET 1865; stamp number: ET 1729.



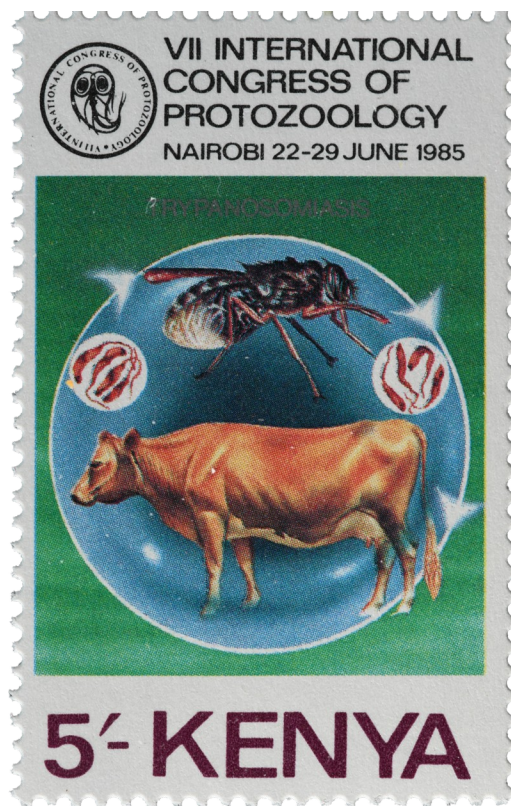
Glossinia spec. – **Ethiopia 2009:** Pan African Tsetse & Trypanosomiasis eradication campaign, 45 Ethiopian cent. – Michel number: ET 1866; stamp number: ET 1730.



Glossinia spec. – **Gabon 1979:** Eradication de la maladie du sommeil, 1879 - Docteur Jamot - 1937, 300 Central African CFA franc. – Michel number: GA 715; stamp number: GA C226.



Glossinia spec. – **Gabon 1983:** Glossinidae [Insectes nuisibles], 90 Central African CFA franc. – Michel number: GA 882; stamp number: GA 547.



Glossinia spec. – **Kenya 1985:** Trypanosomiasis [VII International Congress of Protozoology, Nairobi 22-29 June 1985], 5 Kenyan shilling. – Michel number: KE 332; stamp number: KE 339.



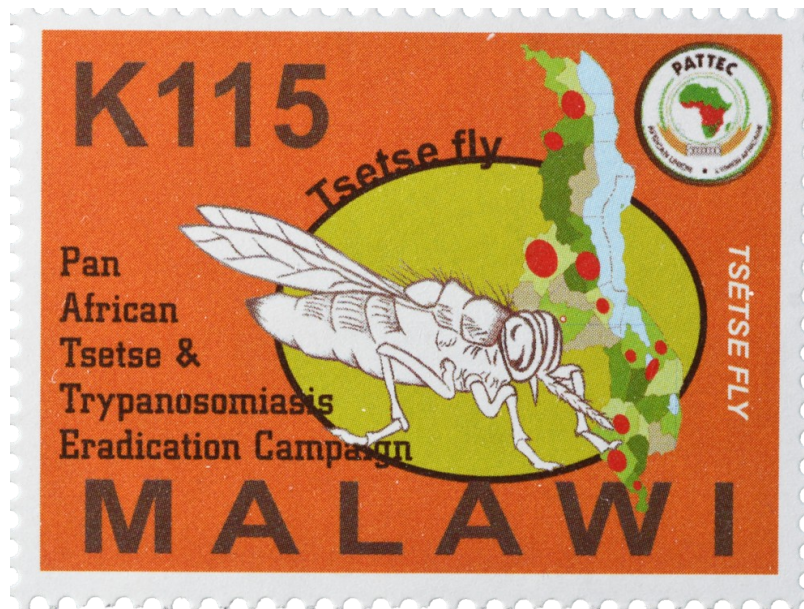
Glossinia spec. – Kenya 1995: Tsetse fly [25th Anniversary ICIPE], 14 Kenyan shilling. – Michel number: KE 626; stamp number: KE 655.



Glossinia spec. – Malawi 2012: Tsetse fly [Pan-African Tsetse & Trypanosomiasis Eradication Campaign], 65 Malawian kwacha. – Michel number: MW 850; stamp number: MW 770.



Glossinia spec. – **Malawi 2012:** Tsetse fly [Pan-African Tsetse & Trypanosomiasis Eradication Campaign], 110 Malawian kwacha. – Michel number: MW 852; stamp number: MW 772.



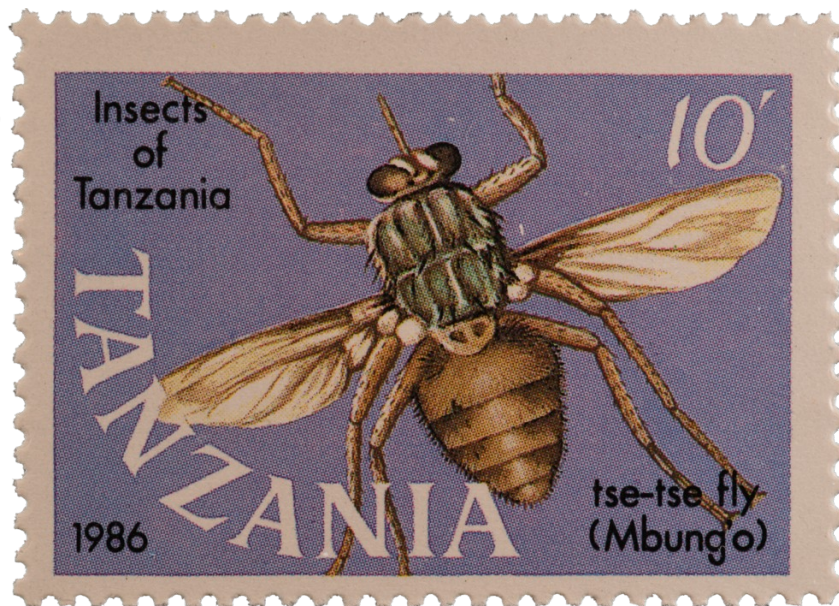
Glossinia spec. – **Malawi 2012:** Tsetse fly [Pan-African Tsetse & Trypanosomiasis Eradication Campaign], 115 Malawian kwacha. – Michel number: MW 853; stamp number: MW 773.



Glossinia spec. – Poland 1978: śpiączka afrykańska, tse tse - *glossina* [czwarty międzynarodowy kongres parazytologów], 6 Polish złoty. – Michel number: PL 2568; stamp number: PL 2275.



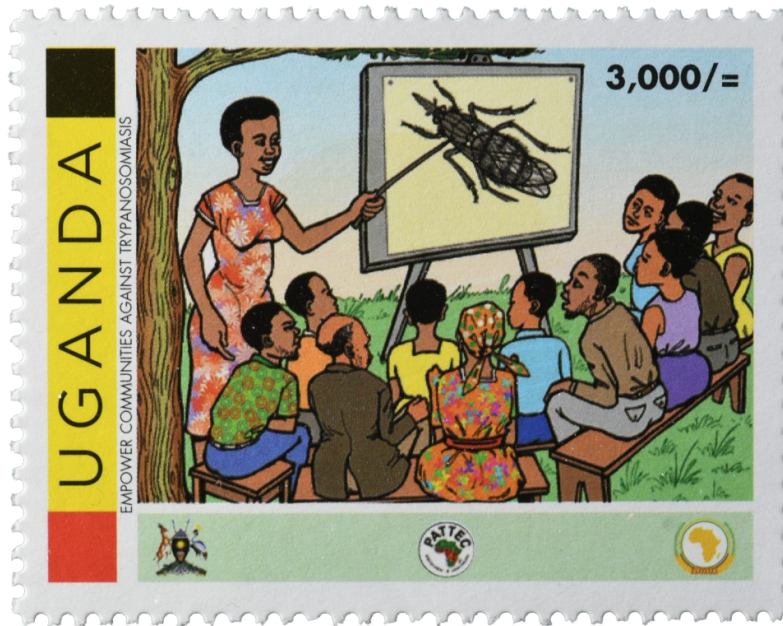
Glossinia spec. – São Tomé and Príncipe 1967: Aires Kopke, *Glossina palpalis*, Correios [Clube Militar Naval, 1866-1966], 2.50 Portuguese escudo. – Michel number: ST 405; stamp number: ST 394.



***Glossinia* spec.** – **Tanzania 1986:** tse-tse fly (Mbung'o) [Insects of Tanzania], 10 Tanzanian shiling. – Michel number: TZ 401; stamp number: TZ 366.



***Glossinia* spec.** – **Uganda 2002:** *Glossina austeni* [Flora & Fauna], 4000 Ugandan shilling. – Michel number: UG 2482; stamp number: -.



Glossinia spec. – **Uganda 2011:** Empower communities against Trypanosomiasis [African Trypanosomiasis and the Tsetse Fly], 3000 Ugandan shilling. – Michel number: UG 2717; stamp number: UG 1915.



Glossinia spec. – **Uganda 2011:** War against Tsetse flies in Uganda [African Trypanosomiasis and the Tsetse Fly], 1600 Ugandan shilling. – Michel number: UG 2716; stamp number: UG 1914.

Acknowledgement

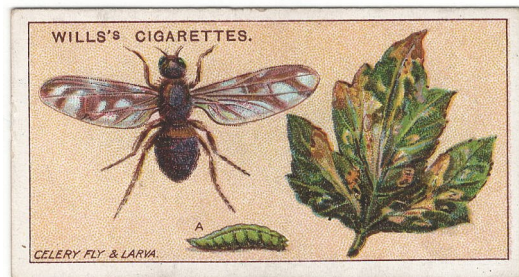
Thanks to David Clements who checked the manuscript! Any comments concerning either the identification of the Diptera shown or references to overlooked stamps would be very welcome!

Diptera Trading Cards and Trade Cards (III), Cigarette Cards, first half of the 20th century

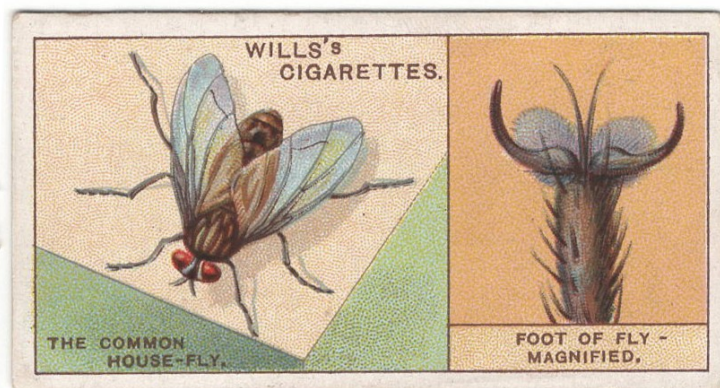
Stephen D. Gaimari

North American Dipterists Society, P.O. Box 231113,
Sacramento, California 95823, USA; sgaimari@dipterists.org

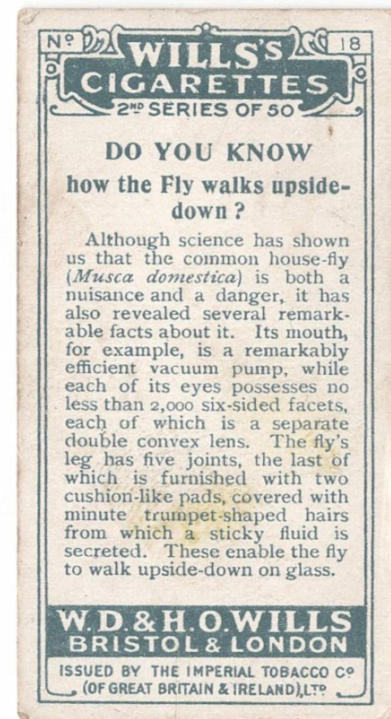
As a further contribution to my series on collecting dipterocentric (or at least featuring flies) trade and trading cards, I here focus on cigarette cards. As an ex-smoker, I can appreciate that cigarette packs no longer have such cards, as it might have kept me hooked! Cigarette cards were popular from around 1875 into the 1940s as inserts into cigarette packs to stiffen one of the sides so the cigarettes inside would not get crushed, and to advertise the brand. Not to say cigarette cards with flies on them were popular! They were not – there seem to be very few. Rather most were focused on what was popular at the time, from sports figures, politicians and other famous people, to other (non-fly) animals and plants. The single most expensive card in all of card collecting is a cigarette card – the 1909 T206 Honus Wagner card that sold recently for more than \$6.6 million! Pretty sure my fly-focused cards don't fall into that category, but they are of interest to me nonetheless! So here are some of my cigarette cards, displaying the front and back, and a short explanation. Note, the cards are displayed at 140% scale to make them easily readable, but the actual size is displayed on the card to the right, which will have its own entry below.



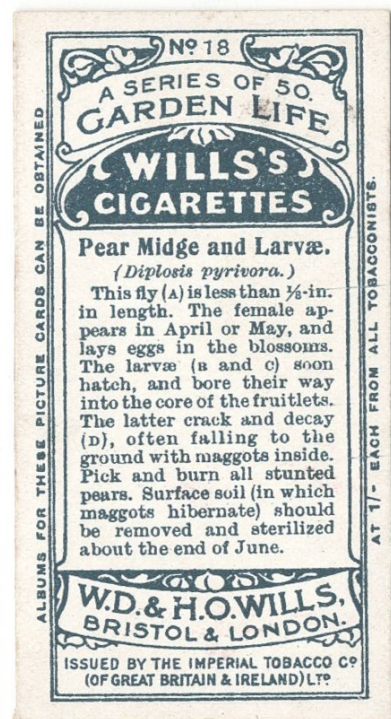
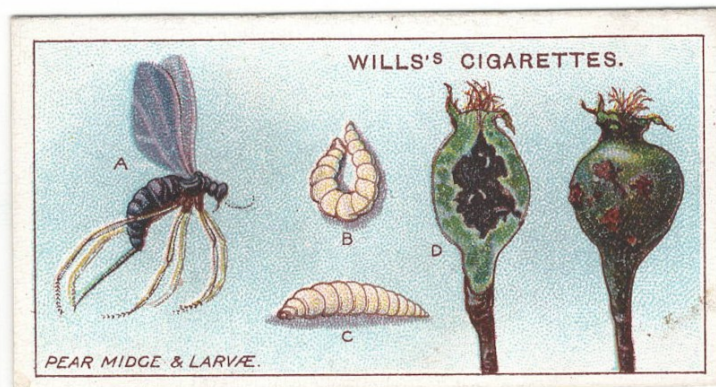
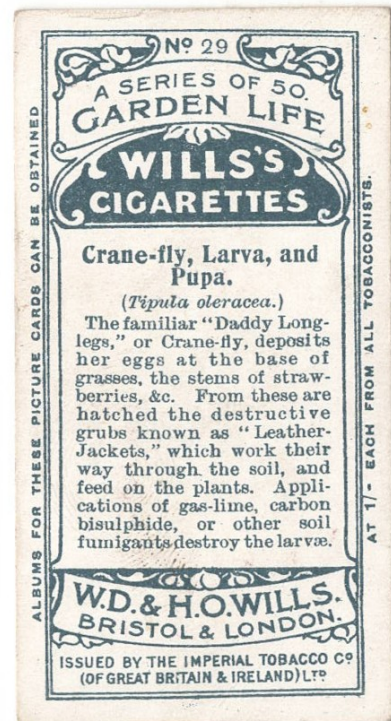
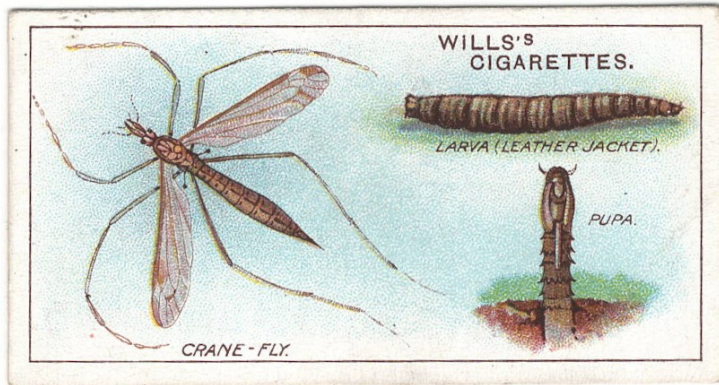
The first several cards below are from Will's Cigarettes. W.D. & H.O. Wills was founded in 1789, and was not only the first British company to mass-produce cigarettes, but were also one of the first companies to include these kind of cards in their packs. Wills was a founding company of the Imperial Tobacco Company in 1901, with William Henry Wills as its first chairman.



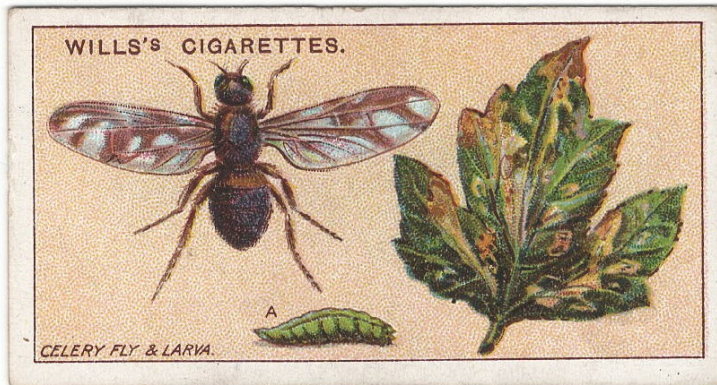
This card, featuring *Musca domestica* is of the educational variety, in the "Did you know?" series from the 1910s. This is in the 2nd series by this name, with 50 cards.



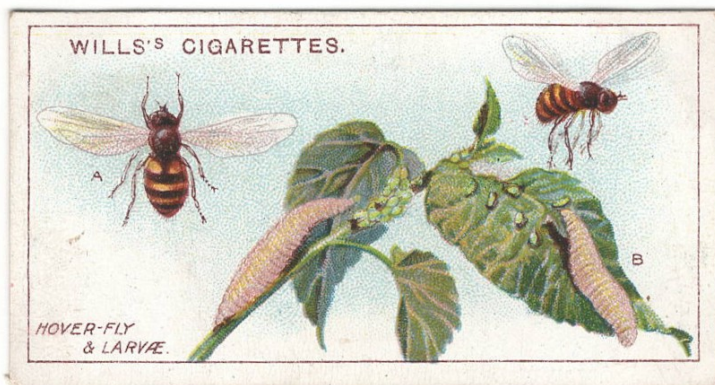
The next four cards are from Will's Cigarette's "Garden Life" series of 50 cards, from 1915.



The species depicted is now in the genus *Contarina*.

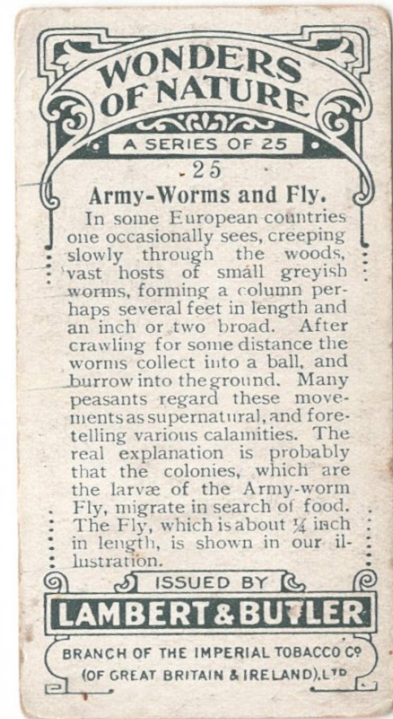


The species is *Euleia heraclei* (Linnaeus).

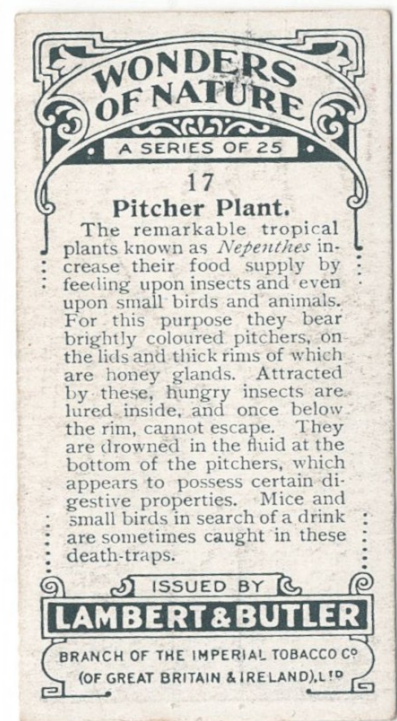


Lambert & Butler was another early British cigarette manufacturer, founded in 1834, that merged with the Imperial Tobacco Company in 1901. After becoming part of that company, they started releasing cigarette cards in the 1910s and continued for two decades. The four cards below are from the early days of their producing cigarette cards.

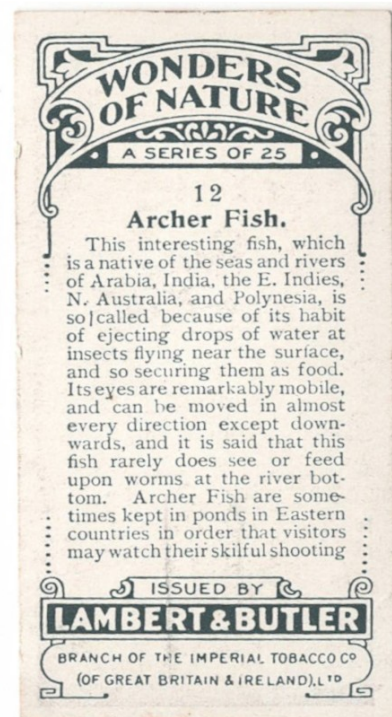
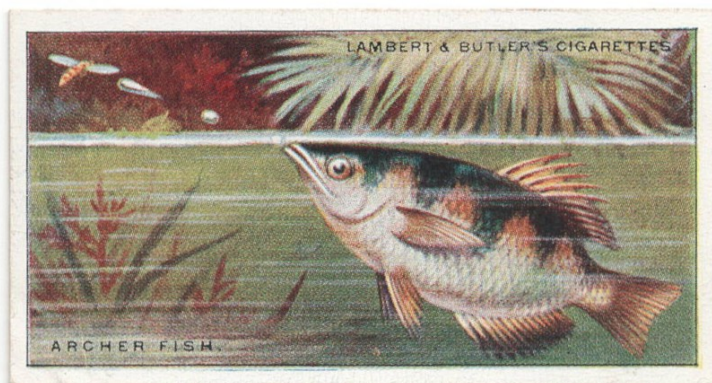
My cards from Lambert & Butler are all from the “Wonders of Nature” series of 25 cards. They mostly only feature Diptera – that is, as food for other organisms. The exception is the card to right about *Sciara militaris* Nowicki.



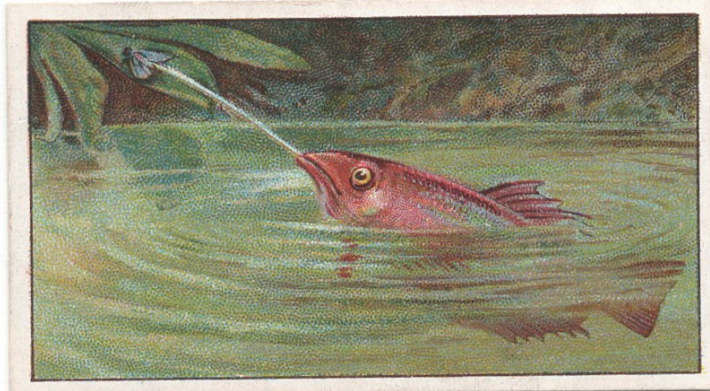
The next three cards, all from the same series as the previous one, depict dipterans as food. The first being food for pitcher plants. No particular fly species are specified, but if you use your imagination you might find figure some of them out!



It is obvious that the praying mantis is the feature-insect of the card to the right, but it is certainly eating a fly!



This archer fish is certainly going after that fly. Fish are a quite popular subject for cigarette cards. Many more are available than for insects, so it is fortunate to find one (actually two, see the next page) where a dipteran is featured.



This second archer fish going after a fly is from B. Morris & Sons, in their 1912 “Marvels of the Universe” 3rd series. Another early and very popular 19th century British tobacco manufacturer, Morris seemed to have escaped the grasp of the Imperial Tobacco Company, and was a very large company in its own right.



This interesting card features a bot fly, *Hypoderma diana*. It is from the Salem Zigarettenfabrik, a German tobacco manufacturer founded in the late 19th century. As a point of interest, the US-based R.J. Reynolds Tobacco Company manufacturers Salems, which are now exclusively menthol filter cigarettes. The card, from 1928, is part of the large series “Seltsame insekten unter di lupe” (Strange insects under the magnifying glass). I don’t



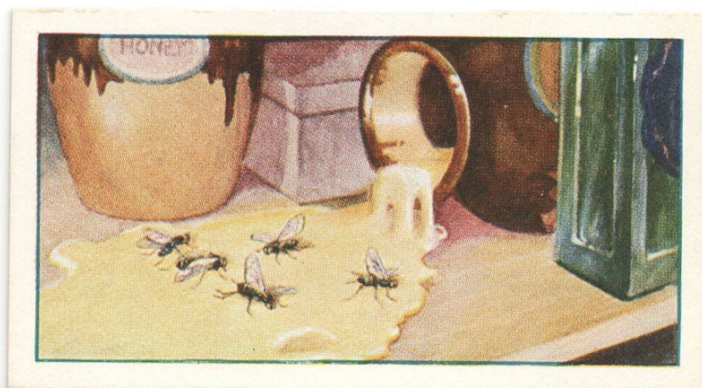
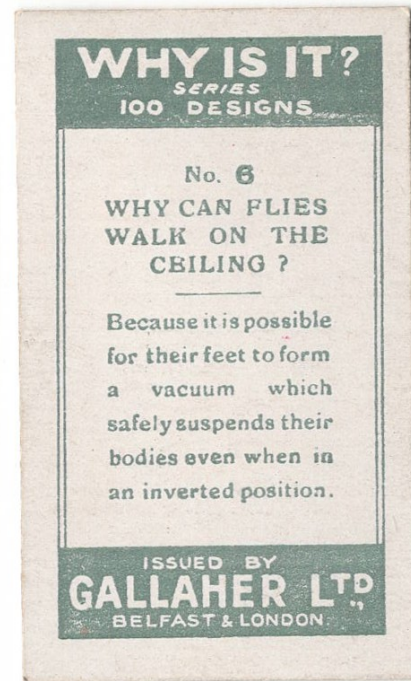
know how they see this, but part of the text reads “The head of this insect resembles a monkey face” and most of the text is referring to how it looks like a monkey! Note, this card has slightly different dimensions than all of the previous cards, although is about the same size overall.



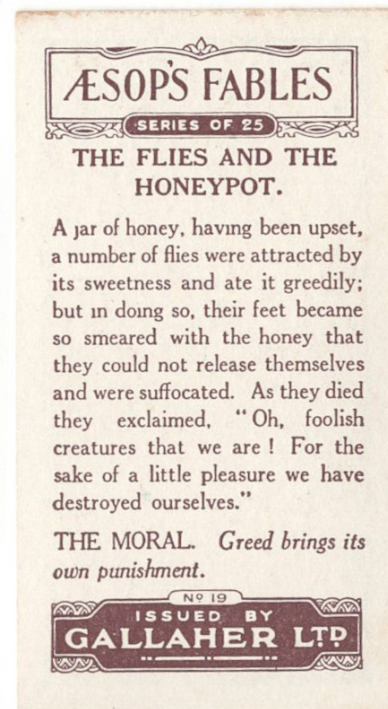
The following two cigarette cards are from the tobacco manufacturer Gallaher, founded in 1857 in Belfast, which became one of the largest tobacco factories in the world at the end of the 19th century. They are currently a subsidiary of the Japan Tobacco International, although for some years in the early 21st century they were part of the R.J. Reynolds group. They also seems to avoid becoming part of the Imperial Tobacco Company, and like that company, Gallaher bought up other smaller tobacco companies.



This card, from the “Why is it?” series (which consisted of 100 cards) is from around 1920, and seeks to inform the smoker why flies can walk on the ceiling.



This card seeks to teach a moral lesson in its “Aesop’s Fables” series of 25 cards. I have now learned that consuming available food is somehow greedy, and I will be punished for it! Good thing if I want to lose weight!



One of my only anthropomorphic cigarette cards comes from Churchman's Cigarettes from the 1920s – "Ma Fly". This card, #30 in a series of 52 called "Frisky", is to be used in several different games described in the insets given with the cards (which I unfortunately don't have!). Pretty obvious incentive to keep buying these cigarette packs if you want to play the game!



MEETING NEWS

10th International Congress of Dipterology (ICDX), 16–21 July 2023 in Reno, Nevada, USA

Stephen D. Gaimari, Martin Hauser & Shaun L. Winterton

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3294 Meadowview Road, Sacramento, California 95832, USA

North American Dipterists Society, P.O. Box 231113, Sacramento, California 95823, USA;
sgaimari@dipterists.org, shaun.winterton@cdfa.ca.gov, phycus@gmail.com

The 10th International Congress of Dipterology (ICDX) is right around the corner, less than a month away! The Congress will run from 16–21 July 2023 in Reno, Nevada, USA. Although abstract submission is closed, you can still come! (see <https://dipterists.org/icdx>) But you'll have to act fast. You all (who are on the *Fly Times* mailing list and dipterists listserver) have been innundated with messages over the last months, so I am pretty sure you all know the details. But to reiterate a few, we have a great array of symposia (<https://dipterists.org/icdx/symposia.html>) thanks to all of the symposium organizers! And we have a fantastic array of plenary and banquet speakers to look forward to! The Dipterists Society is pleased to have provided travel grants to nine students from five countries, and we look forward to their contributions, and those of all the students attending! We are grateful to all of our sponsors (<https://dipterists.org/icdx/sponsors.html>), without whom we could never have put together this Congress! See you there, or if you are not attending, see you next time! There will surely be a post-Congress report in the next issue of *Fly Times*!

For those of you attending, note that you can sign in and pick up your badge, etc., in front of the Silver Baron A Ballroom at the Silver Legacy (this is on the same floor as the hotel lobby), any time after 13:00 on Sunday, 16 July, after which will be a Welcome Reception in the same ballroom starting at 18:30. If you are signing in on Monday morning, 17 July, you can do so in the Royal Salon (in front of the Exposition Halls on the lower level) at the Dipterists Society booth.

North American Dipterists Society 18th Field Meeting, Summer 2024

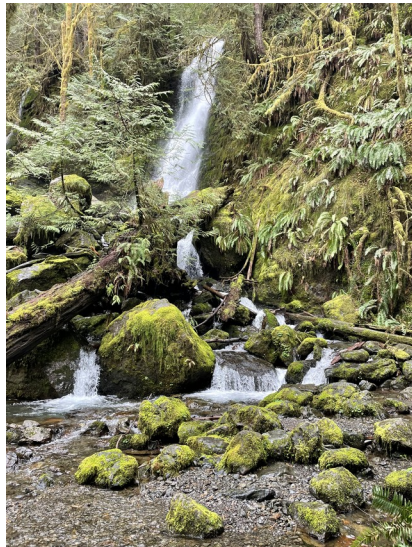
Barbara Hayford¹ & Andrew Fasbender²

¹Coastal Interpretive Center, Ocean Shores, Washington, USA; bhayford@gmail.com

²Rhithron Associates Inc., Missoula, Montana, USA; afasbender@rhithron.com

The 18th Field Meeting of the North American Dipterists Society is scheduled for summer 2024 in western Washington state. We are still in the process of securing a venue, due to candidate facilities not booking reservations until later this summer. A full announcement of the meeting location, date and potential collecting opportunities/sites will be included in this Fall 2023 issue of *Fly Times*, the NADS Field Meeting website at https://dipterists.org/field_meetings.html, and through the dipterists mailing list (<https://lists.dipterists.org/mailman/listinfo/dipterists>).

Western Washington hosts a dynamic and diverse landscape (see the various photographs here). We have permission to sample in Washington State lands and on US Forest Service lands on the Olympic Peninsula. Ecosystems range from Puget Sound lowlands to coastal wetlands and Olympic highlands. Unique sphagnum bogs are easy to reach closer to the Pacific coast. Coastal forests are interspersed with meadows and prairie regions, many retaining native vegetation. Alder, western hemlock, western red cedar, and Sitka spruce dominate coastal forests and diverse shrubs and forbs provide abundant Diptera habitat. Upland forests are characterized by strands of Douglas fir and bigleaf maple. North temperate rainforests may be accessed on US Forest Service land outside of the Olympic National Park via well maintained paved and gravel roads.



Coastal and dune wetlands are common along the Pacific coast and some tidal pools are available for sampling. Shoreline sampling of the best estuaries along the US Pacific coast south of Canada should provide some interesting specimens. Salt marshes are easily accessed, too. And for the aquatic Dipterists in our group, Western Washington has abundant springs, bogs, and lakes. Rivers transition from slow muddy deltas with strong tidal influence to cool, montane creeks.



We have explored many sampling sites over the past year and are set to do some terrestrial sampling this summer, so we will have a map with a variety of sampling sites to choose from for the 2024 Field Meeting for the North American Dipterists Society.

**8th International Forum for Surveillance and Control
of Mosquitoes and Vector-borne Diseases
Beijing, China, October 23-27, 2023**

Rui-De Xue

Anastasia Mosquito Control District, 120 EOC Drive, St. Augustine, FL 32092

The 8th International Forum for Surveillance and Control of Mosquitoes and Vector-borne Diseases will be held in Beijing, China, October 23-27, 2023.

The meeting theme is The World Needs Mosquito Control: Innovation and Application.

Dr. J. Lyell Clarke will give the KEYNOTE, with the topic being “The World Needs Mosquito Control: The Industry Plays an Important Role in the Pipeline.”

The registration fee is \$400/per person and the hotel rate is about \$120/room/night.

Please send the title of your presentation to Dr. Zhao at tongyanzhao@126.com or Dr. Rudy Xue at xueamcd@gmail.com

For more information about the meeting, please visit the website at www.asiansvemc.org

DIPTERA ARE AMAZING!

A male of *Chersodromia parallela* (Melander), a species of brachypterous Diptera in the family Hybotidae. Photograph by Zachary Dankowicz. These were found running along the Dungeness Spit in Washington state, and they looked like large black mites to the unaided eye.



BOOKS AND PUBLICATIONS

Book review:

Blow flies (Diptera: Calliphoridae, Polleniidae, Rhiniidae)

Martin Hauser

Plant Pest Diagnostics Branch, California Department of Food & Agriculture
3294 Meadowview Road, Sacramento, California 95832, USA; phycus@gmail.com

Olga Sivell. 2021. Blow flies (Diptera: Calliphoridae, Polleniidae, Rhiniidae) Handbook for the identification of British Insects Vol. 10 part 16. The Royal Entomological Society. 208pp. ISBN: 9781910159064. 40£.

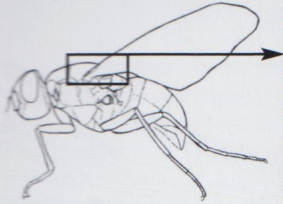
I have never been accused of being overly enthusiastic about Calyptrates in the past. But I always had a curiosity about all kind of flies, and I like getting inspired by publications outside my core interests. So, one day I found a new book in our library and after flipping through the pages, I realized I need to have a closer look! It was “Blow flies” by Olga Sivell, and I was blown away (pun intended) by it.

Being published in the series “Handbooks for the identification of British Insects”, it has an emphasis on identification. The keys are richly illustrated and are complemented by detailed accounts for each taxon. The book has nearly everything: starting with an introductory chapter, which includes sub-chapters about classification, a UK species checklist, biology, collecting and preservation, and references where to find keys to identify immature stages. Next is the morphology chapter, with very

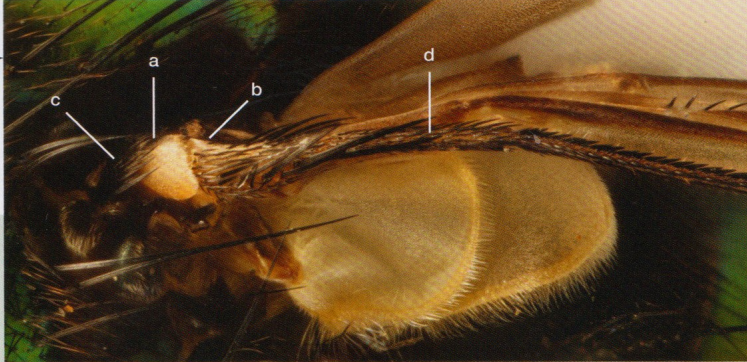
detailed illustrations and photographs explaining (and illustrating) all important structures. And these flies have a lot of hard to explain characters, which, especially for the beginner, pose a significant challenge. I really like the use of macrophotographs, SEM pictures, and line- and color-drawings, which often show the same structures and complement each other. I have seen publications with a multitude of different techniques, but the reason was mainly that the author(s) were (re)using old illustrations and whatever they had available. This is a very different approach. Olga Sivell chose the techniques wisely, because each different illustration technique has their strength and their weakness. By depicting a certain structure for example by a photograph and the same view as a line drawing, makes the structure much clearer and easier to find on the fly.



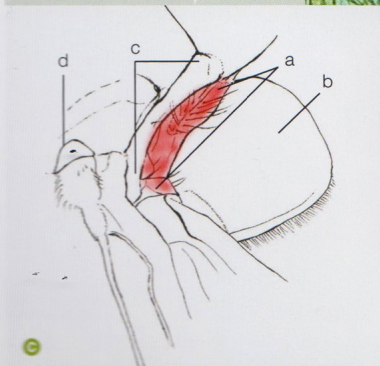
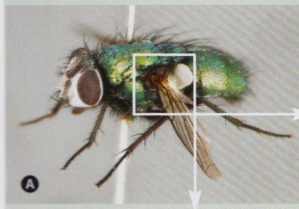
Basicosta. Small anatomical structure at proximal end of the wing, at the base of costal vein. It can be dark (brown, black) or pale (creamy, yellow, orange).



Stacked photograph showing position of the basicosta in close-up: (a) basicosta, (b) costagium, (c) tegula, (d) costa.

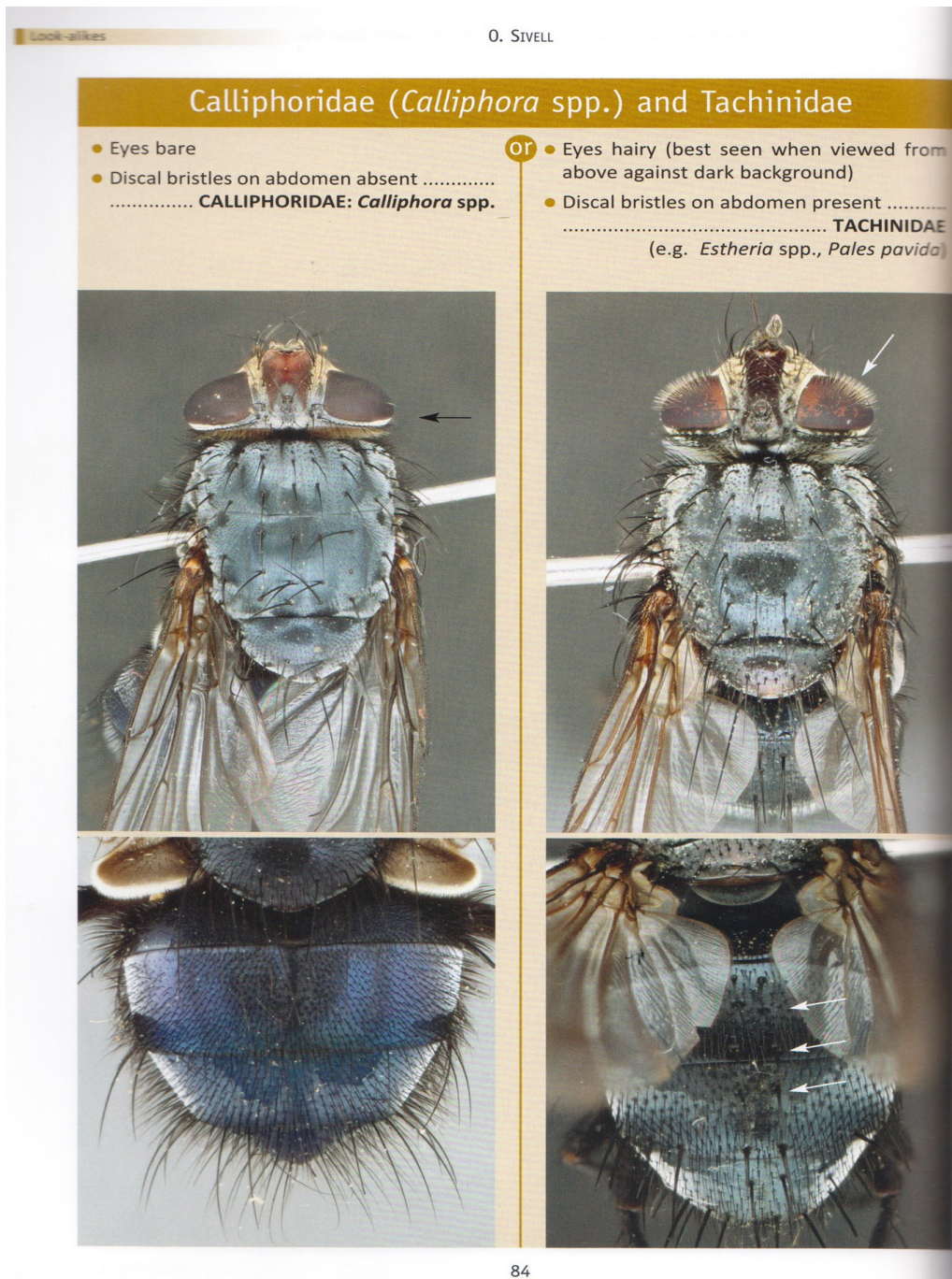


Suprasquamal ridge. Also called calyptal fold or squamal fold; a narrow structure located directly above the calypters (squamae) and below the postalar wall (also called postalar declivity). It can be bare or with patches of hairs at its ends. It is best visible when wings are extended, but can also be seen (although somewhat concealed) when they are in an upright position. It is useful to slightly push the wings away from the body with a pin when pinning a specimen.



Ⓐ Photograph showing position of the suprasquamal ridge. Suprasquamal ridge position in close-up on Ⓑ photograph and Ⓒ a sketch (a) suprasquamal ridge (marked in red on the drawing), (b) lower calypter, (c) postalar wall, (d) basicosta.

The main body of the book consists of the keys, and again, lots of thought has been put into their design and execution. First is an introduction on how to use the keys and their features, and then the first key separates Calyptrate and Acalyptrate, followed by a key to the Calyptrate families (of the UK).



The other keys are to the Calliphoridae, Polleniidae and Rhiniidae, which have been recently elevated to family level and then sunk again or not... sorry could not keep up with the latest fad. But this is not really important for this book, because it is for species identification, and therefore it is not relevant, which higher classification these species might be in. These keys to species have all relevant characters illustrated, again, with a mix of the best suitable illustration techniques.

Dissections of the female and male genitalia, chaetotaxy and color characters are all provided to ensure an unambiguous successful identification. For the more difficult to ID species of the genera *Bellardia*, *Calliphora* and *Lucilia*, a table based on male genitalia is provided, which includes a brief description, a drawing, and a photograph of the posterior and lateral views. This is followed by a chapter on look-alikes, which is extremely helpful, separating some Muscidae, Tachinidae and others from very similar looking Calliphoridae. It is fascinating to see species of different families next to each other, which look identical.

The species accounts follow (in alphabetical order), including a list of synonyms, a common name, a brief description, similar species, identification method (if it can be identified by pictures or if requires dissection), distribution, seasonality, and biology. All species are illustrated with a habitus and other detail photographs of the species. A very useful chapter is “Potential newcomers”, listing many species which are known from close geographic proximity, or which are spreading throughout Europe due to human activity or/and climate change. This chapter will clearly prolong the usefulness of this work. The last chapter is a very nice “wanted poster” (called “head view”) of all the species, showing the lateral and frontal view of males and females, which makes for a great quick reference tool for the species.

After my initial read of this book, I deeply regret that I donated all my European calliphorids! It would have been a pleasure working on their identification with this key.

The only downside is the geographical restriction to the UK. I wish it would cover a larger area, but I know, that it would take an exponential amount of effort to expand this work to Europe. I hope that other dipterists take this book as an inspiration (as I did) and maybe accept the challenge to expand the geographic framework.

SOCIETY BUSINESS

On the back pages of *Fly Times*, North American Dipterists Society business is recorded, as is desired for Society transparency.

Two documents are here provided for the record. They are:

- 1) The approved minutes of the annual meeting of Directors, held 10 December 2022, prepared by Secretary Shaun Winterton (7 pages)
- 2) The financial statement as part of the minutes of the 2022 annual meeting of Directors, updated at year end to reflect the full fiscal year (calendar year). Prepared by Treasurer Chris Borkent (1 page).

As of this writing, following are the Directors and the Officers of the Society.

Directors

Stephen Gaimari
Jessica Gillung
Martin Hauser
Shaun Winterton
Christopher Borkent

Officers

Stephen Gaimari, President
Martin Hauser, Vice President
Shaun Winterton, Secretary
Christopher Borkent, Treasurer
Jessica Gillung, Meeting Chairperson
Barbara Hayford, Field Meeting Co-Chair
Andrew Fasbender, Field Meeting Co-Chair
Andrew Young, General Meeting Chair

North American Dipterists Society

DIRECTOR'S MEMO



31st May 2023

Prepared and filed by: Shaun L. Winterton, Secretary
North American Dipterist Society.

Minutes of Directors Meeting

Held Sunday, 10th December, 2022, call to order at 1:23pm at Large Conference Room, CDFA/PPD, 3294 Meadowview Rd., Sacramento, CA 95832.

Presiding: Steve Gaimari

Secretary: Shaun Winterton

Attendance: In person: Stephen Gaimari (Director/President) (SDG), Martin Hauser (Director/Vice President) (MH), Christopher Borkent (Director/Treasurer) (CB), Shaun Winterton (Director/Secretary) (SLW). **Virtual:** Jessica Gillung (Meeting Chairperson) (JPG), Andrew Young (General Meeting Chair) (AY), Barbara Hayford (BH) & Andrew Fasbender (AF) (proposed organizers for next Field Meeting).

Apologies: Jon Gelhaus (Field Meeting Chair).

Item 1. Treasurer's report (CB):

(interim and final financial summaries filed in the main office and Secretary's record):

- As of Nov 30, 2022 (interim), total income was \$42,824.30 and total expenses were \$7,852.66. Ending balance was \$59,124.32.
- Submitted by CB. Moved by MH, seconded by SLW.
- Note, the final 2022 financial summary was provided by CB after the meeting on Mar 10, 2023, and corrected by SDG and returned on Mar 17, 2023, with a total 2022 income of \$45,387.25 and total expenses of \$8,039.29, and the final 2022 balance of accounts is \$61,501.28.

Item 2. Old business.

1) Review of Unanimous Written Consents executed in 2022:

- Creation of Officer positions for running Society meetings
- Appointment of JPG to the Office of Meeting Chairperson.
- Appointment of AY to the Office of Field Meeting Chair.
- Coverage of field meeting costs and grants program.
- Purchase of General Liability and Directors & Officers insurance coverage.
- Approval of the minutes of the 2021 Annual Directors Meeting.
- Purchase of custom-designed brochures, stationery, and postage for sponsorship requests.
- Design competition for merchandise for Society and ICDX, with designation of cash prize.
- Modification of date and time of 2022 meeting.

- 2) *Review of action items from minutes of previous meeting* (SDG):
- Continued use of IATS Payments for online financial transactions, such as memberships, donations, and meeting registrations. Note, direct wire transfer and checks are alternative payment methods.
 - Continued use of Mark Zivkovic (Pasquesi-Sheppard LLC) for tax preparation for the 2022 tax year. Taxes have been so far prepared *gratis*, with no expectation that there will be no charges moving forward. Tax filing for 2021 done on time, documents provided by SDG.
 - Documents for non-profit status submitted on time during 2022 by SDG to the California Attorney General (registration, annual treasurers report). Documents to California Secretary of State (Corporation Statement of Information) not due until 2023.
 - Payment for PO Box continued.
 - Meeting minutes posted in Fly Times issue 68.
 - Insurance options: Using the Nonprofits Insurance Alliance of California (NIAC), we selected Gerber Gost in Bakersfield for both General Liability and Directors & Officers coverage; premium is \$1,310 per year. Certificates of property insurance and liability for \$500,000 and \$1,000,000, respectively, given for Field Meeting. We will need same for ICDX.
 - Field meeting tasks as discussed in the 2021 Directors meeting were accomplished thanks to the hard work of Jon Gelhaus and his students.
 - Fly school support proposal tabled (direct support and student support); SDG proposed tabling again, seconded by CB.

Item 3. *Reports*

- 1) *18th Field Meeting proposal and update* (BH): Field Meeting proposed to be held in western Washington, University of Washington site; field site in mid June to mid July; BH cautioned that food costs may increase in advance of meeting; excellent diversity of habitats for collecting; organisers have good contacts with state so permits should not be difficult to acquire; SDG suggested entering into a contract to lock in food prices.
- 2) *Entomological Society of America general meeting* (AY): attendance was considered good; talks were limited by ESA rules on number of presenter slots available. Talks are now up on the Society youtube channel, <https://www.youtube.com/@dipterists>.
- 3) *17th Field Meeting* (JPG): (summary provided by Jon Gelhaus). Gelhaus lab organized the meeting held from 13–17 June 2022 in the New Jersey Pinelands (aka the Pine Barrens), with the host venue being the Lighthouse Center for Natural Resource Education, in Waretown, New Jersey. Using the Dipterists Society web portal for registrations was successful. Two students were supported (\$500 each) through the Society's travel grants competition, and registration and lodging costs were covered for two additional students through Society funds, and three additional students through the James Bossert and Chen Young Diptera Research Fund at the Academy of Natural Sciences. There were 21 attendees, including 3 undergraduates and high school students, 7 graduate students, 5 faculty, and 6 other researchers. There were 9 presentations over two sessions, including 5 given by students. Further summary was published in Fly Times issue 69, and a separate summary report by Jon Gelhaus was filed with the main office and the Secretary's record.

Minutes of Directors Meeting
10th Dec., 2022

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- 4) *Membership* (SDG): 57 paid members (all except one have renewed), including 32 new members in 2022; 22 are founding members and five continued at this rate. Our membership consists of people from 5 countries, as follows: 3 Australia (2 as Founding Members), 11 Canada (5 Founding Member, 6 Individual Members, 2 of which were student rate), 2 Germany (1 Founding Member, 1 Individual Member), 2 UK (1 Founding Member, 1 Individual Member), 40 USA (26 Founding Members, including the 4 Founding Directors, 14 Individual Members (5 of which were student rate)).

Note, since the end of the Director's meeting, but still in 2022, an additional 18 members paid (some of which were renewals), including 6 additional founding members (2 of which upgraded from individual or student memberships). The membership by country is supplemented with Australia (1 additional Founding Member), Denmark (1 Founding Member), France (1 Individual Member), UK (1 additional Individual Member), USA (2 additional Founding Members, 1 additional Individual Member)

List of founding members was read out by SDG, and are here listed for the record, including those who became founding members in the days of 2022 after this meeting was held:

Matt Bertone	Robert Kimsey
Art Borkent	Edward Lisowski
Chris Borkent	Steve Marshall
Will Bouchard	Julia Mlynarek
Brian Brown	Leonard Mustermann
Stephen Bullington	Riley Nelson
Peter Cranston	Allen Norrbom
Jeff Cumming	Thomas Pape
Greg Dahlem	Adrian Pont
Torsten Dikow	Paul Rude
Kathleen Donham	Bjoern Rulik
Michael Engel	Justin Runyon
Steve Gaimari	Casey Rush
Jon Gelhaus	Ken Schneider
Jessica Gillung	Gary Steck
Martin Hauser	John Stireman
Barbara Hayford	James Wallman
James Hogue	Brittany Wingert
Larry Hribar	Shaun Winterton
Morgan Jackson	Norman Woodley
James Kennedy	David Yeates

- 6) Members in 2022; 22 are founding members and five continued at this rate. Our membership consists of people from 5 countries, as follows: 3 Australia (2 as Founding Members), 11 Canada (5 Founding Member, 6 Individual Members, 2 of which were student rate), 2 Germany (1 Founding Member, 1 Individual Member), 2 UK (1 Founding Member, 1 Individual Member), 40 USA (26 Founding Members, including the 4 Founding Directors, 14 Individual Members (5 of which were student rate)).
- 7) *Website* (SDG): Society and ICDX websites are being actively developed. The portal for ICDX registration and submitting abstracts will be up in January. The portal for Field Meeting registration was very successful, allowing people to pay for registration and

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lodging at one time. Our online payment system continues to be iATS Payments for membership, donations, and meeting registrations. The 17th Field Meeting webpage will soon be archived, to be continually available on our website. Google Analytics: 1800+ "total clicks" (how many times a user clicked to our site), 180,000 "total impressions" (how many times a user saw a link to our site in their search results), and of these, the "average position" was 29.8 (the position of our site in search results). Our top query was for "International Congress of Dipterology", followed by "Fly Times" and "North American Dipterist Society".

- 8) *Dipterists Directory* (SDG): Total of 135 people in the directory, up from 83 last year. 28 countries are represented, including 4 African countries, 4 Asian, 2 Australasia, 10 European, 1 Middle Eastern, 3 North American, and 4 South American. Of these, ca. 50% are from North America, followed by 21% from Europe.
- 9) *Dipterists mailing list* (SDG): We continue to use MailmanLists. We have 771 people signed on from 87 countries, including 26 African countries, 10 Asian, 2 Australasian, 2 Central American, 32 European, 5 Middle Eastern, 3 North American, 7 South American. There were 18 threads in 2022, with a flurry of posts in March regarding Ukrainian collections. Other posts were about meetings, open positions, publications, grants, etc.
- 10) *Social media – Facebook* (SDG): 902 people "like" (an increase of 396 from previous year) and 955 "follow" (an increase of 411) the page. ii. There were 29 posts this year, with modest numbers of comments and likes. In the last 28 days, our post reach (the number of people who saw any of your posts at least once) was 1093, while the post engagement (the number of reactions, comments, shares and clicks on your posts) was 224. iii. We had a few posts with high reach and engagement, with more than 700 people reached, more than 50 engaging or sharing, but most posts tend to be in the 150 to 500 range for reach, and a couple dozen engagements and shares.
 - Twitter (CB): 316 followers on Twitter, posting and reposting about once a week related to flies.
- 11) *Publications* (SDG): The Spring 2022 issue (68) was published on 17 June, with 20 articles, 33 authors, as well as posting our previous Board Meeting minutes. The Fall 2022 issue (69) is set for publication before 20 December. Fly Times Supplement 4 was published online in February, and was published in hard copy by the authors and is available as print-on-demand. The title is "The Horse Flies and Deer Flies of Idaho, Oregon and Washington State (Diptera: Tabanidae)" by Anthony Thomas, Luc Leblanc, and Bill Turner, noting this was Bill's last publication as he passed away very shortly after its publication. There are currently 4 supplements in planning or draft stages from several authors. No articles were published in MYIA in 2022.
- 12) *ICDX planning update* (SLW): Preparations are progressing, with the organizing committee meeting virtually to discuss updates. We used cost estimates to determine registration rates for student and regular delegates, which will be determined by the end of December or early January. Sponsorships are being actively sought. ICDX merchandising will include t-shirts, tote-bags, mugs, etc. We have a Congress logo, and announced a competition for additional designs, with excellent entries so far. It is critical that delegates stay at the venue hotel, as our concessions are all based upon filling hotel rooms. Twenty symposia are planned covering a breadth of topics, and plenary

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speakers have been invited and accepted, including May Bernebaum (University of Illinois), Charley Eiseman (Massachusetts), David Grimaldi (American Museum of Natural History), Fiona Hunter (Brock University), Erica McAlister (The Natural History Museum) and Rudolf Meier (Museum für Naturkunde). Congress tours are being planned. A separate report was filed with the main office and the Secretary's file.

- 13) *ICDX sponsorships* (SDG): Brochures were designed and 176 requests were sent out by mail to foundations, societies and other potential funding sources, as well as 4 online applications, 16 emails, and 2 telephone calls. Responses so far included 18 turn-downs, 6 positive results tallying \$26,160, and several made positive but not-yet committed responses. Followup contacts are being undertaken presently. Among the sponsors as of the date of this Director's meeting are: The Linnean Society of London, Pensoft Publishers, the International Union of Biological Sciences, Don't Pack a Pest, the Reno-Sparks Convention & Visitors Authority, and Mike & Bonnie Irwin. Still within 2022, but after the date of this meeting, we have had 5 additional sponsorships (for an additional \$12,755), from the Center for Biological Diversity, NHBS Ltd, the Royal Entomological Society, the Species File Group, and Terry & Faye Whitworth.

Item 4. *New business.*

- 1) *Field meetings*: Thanks were given to Jon Gelhaus for running the 17th Field Meeting very effectively and serving as Field Meeting Chair. Note, final report on the meeting was published in *Fly Times* issue 69. Motion by SDG to accept proposal of 18th Field Meeting as presented, and to provide the Society support needed to run a successful and well attended meeting in Washington state, seconded by SLW. Passed unanimously.
- 2) *Officer positions*: SDG proposed Barbara Hayford and Andrew Fasbender as co-chairs of 18th Field Meeting, each to hold the Officer positions of Field Meeting Chair. Moved by MH, seconded by CB. Passed unanimously. Note, the first announcement was published in *Fly Times* issue 69.
- 3) *Annual Conflict of Interest Statements*: SDG provided these document which were signed by all Directors, and will be sent via email to Officers for signature.
- 4) *The Diptera Society taxes*: SDG described the excellent performance of Mark Zivkovec consulting on the taxes of the society in previous years; SDG suggested a motion to continue using his services in 2023 (noting that in all past years these services were provided *gratis*, but we have no such expectation moving forward); moved by CB, seconded by MH. Passed unanimously.
- 5) *Society payments system*: SDG described the successful use of IATS payments, noting that some countries have had problems (e.g., India, which consistently get the rejection code 15, meaning it was rejected on their side). SDG proposed establishing an alternative payment method as a back up (e.g., PayPal). Moved by CB, seconded by SLW, emended by SDG for CB to report back once he has found a suitable system. Passed unanimously.

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- 6) *Insurance*: Billing cycle in May 2023; SDG proposed keeping present Insurance coverages in 2023, i.e., General Liability and Officers & Directors, and will include the need to get certificates of liability (as was done for the 17th Field Meeting) for ICDX. Moved by MH, seconded by CB. Passed unanimously.
- 7) *Membership*: Current membership is heavily North American, and we need to do a much better job to increase our international membership numbers. The Society already provides resources for all dipterists, and is in no way focused on North American dipterists. SLW suggested using an alternative monicker, i.e., "The Dipterists Society" (as is frequently done by companies and non-profits who use "trading" names) as an informal name in addition to the formal and more cumbersome "North American Dipterists Society". Another suggestion was to officially change the name to the Dipterists Society, to remove any pretense of being geographically limited. With the long absence of any larger society for dipterists, this space is wide open to attract more international membership. Discussion continued and it was decided to not undertake anything formally or informally until after the ICDX, as discussions at ICDX may help inform our way forward.
- 8) *Membership*: SDG relates that membership presently runs through the calendar year and proposed two different models of membership cycles, i.e., Jan 1st or by simple date of payment. SDG proposed sending notices to members to ask if they want to have membership date changed to start of year for recurring membership. All agreed that he should do this, but no formal action was proposed.
- 9) *Calendar of document filings*: SDG related that all filings and actions are up to date and discussed all items that will need to be taken or bills paid during 2023. Among these actions are: renewing our VPS (OVHcloud) [March], filing our state and federal taxes [April], renewing our registration with the Attorney Generals Office of California [April], renewing our domain registry (Dreamhost) [June], renewing our dipterists mailing list platform (MailmanLists) [June], submitting our Corporation Statement of Information to the California Secretary of State [November], USPS P.O. Box renewal [December]. CB motioned to approve all of these actions now, seconded by MH. Passed unanimously.

Item 5. *Election and/or Re-election of Directors.*

- 1) *Number of directors*: SDG proposed increasing the number of directors by one, resulting in five total, seconded by MH. Passed unanimously.
- 2) *New director vacancy*: After asking and receiving confirmation that she is willing to stand for election as a Director, Jessica P. Gillung was nominated by SDG for the position of Director; seconded by MH. Passed unanimously.
- 3) SDG proposed a motion for the one vacant director spot and four re-elected director positions open to be filled with single vote, to include the nominated Jessica Gillung for the vacant position, and the 4 current Directors up for re-election. Seconded by CB. Passed unanimously.
- 4) SDG also proposed that directors keep their current executive roles; motion forwarded by JG; seconded by CB. Passed unanimously.

Item 6. *Date of next Directors meeting.*

- 1) Scheduled Monday 11 Dec, 2023, as per the Society by laws.

Item 7. *Meeting Adjournment*

- 1) Adjournment proposed by JG. Seconded by SLW. Passed unanimously. Meeting adjourned at 16:04 pm.

Submitted by:
Shaun L. Winterton
Secretary

**North American Dipterists Society 2022 Financial Summary
(January 1, 2022 – December 31, 2022)**

Income

Donations	\$35,657.31
Field Meeting	\$3,939.35
Memberships	\$5,790.59

Total **\$45,387.25**

Expenses

Bank fees	\$252.41
Grants	\$1,000.00
Government fees	\$25.00
Insurance	\$1,310.00
Operating cost	\$768.38
Field meeting	\$4,683.50

Total **\$8,039.29**

Net Gain **\$37,347.96**

Beginning balance	Ending balance	Net Change
24153.32	61501.28	37347.96

