



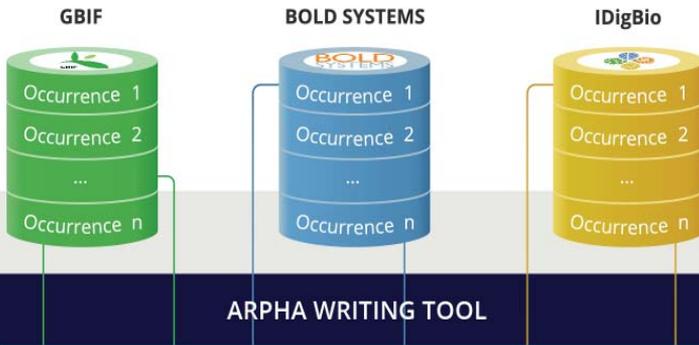
# Entomological Collections Network



Annual Meeting  
Minneapolis, MN, USA  
November 14–15th, 2015  
#EntColl2015



# Online import of occurrence records directly into a manuscript!



## Edit Materials

You may place multiple ID's separated by "|" here

- BOLD record ID (example: ACRJP618-11 | ACRJP619-11)
- BOLD BIN (example: BOLD:AAA5125 | BOLD:AAA5126)
- GBIF via Occurrence ID (example: urn:catalog:HYO:ENT:B1367540 | 4b7b4bb4-0db7-4592-b3f9-1b15b6235360)
- GBIF ID (example: 1061574007 | 240843113)
- iDigBio UUID (example: 1db58713-1c7f-4838-802d-be784e444c4a | d957ac54-ce51-4d40-801e-670b345aa7b6)

## Taxonomic manuscript

### Materials examined

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# Entomological Collections Network Annual Meeting

Saturday, November 14th and Sunday, November 15th, 2015

Hyatt Minneapolis, Greenway C-H  
Minneapolis, MN, USA

## Saturday, November 14th, 2015

7:00–8:30 am                      **Registration and Coffee**  
8:30 am                              **Welcome and Announcements**  
8:30 am–9:00 pm                **Poster Sessions**

Poster 1:                    **The Coleoptera Collections of the  
Natural History Museum, London**

**Max Barclay, Beulah Garner, Roger Booth, Michael Geiser, & Christine Taylor**  
*Department of Life Sciences, Natural History Museum, London, UK*

The Natural History Museum in London has a Coleoptera collection dating back almost 300 years, comprising some 10 million specimens and more than 200,000 species, 94,000 of them represented by type material. In an average year our curators host around 300 visitors, and send more than 30,000 specimens out on loan. We discuss some aspects of the collection and its management, past, present and future.

Poster 2:                    **Quantification of the costs of insect  
collection curation**

**Norman Johnson & Luciana Musetti**

*Department of Entomology, Ohio State University, Columbus, OH, USA*

The operating costs of maintaining an insect collection must be justified to administrators and external granting agencies. Quantification of the costs and benefits of curatorial work is important to effectively compete for funds for hiring personnel and for purchasing equipment and supplies. As a part of the physical recuration of the beetle collection (primarily Carabidae and Tenebrionoidea) at the C.A. Triplehorn Insect Collection, the time expended on individual curatorial tasks was recorded. The data on time-use, and therefore costs, are based on the curation of over 100,000 specimens. Thus, for taxa with reasonably similar handling requirements, the results are a well-documented audit of the investments levels required for curatorial tasks.

Poster 3:       **Testing the utility of museum specimens  
for DNA barcoding and phylogenetics of  
the Colorado potato beetle genus,  
*Leptinotarsa* (Coleoptera)**

**Beulah Garner, Stephen Russell, Mindy Syfert, Sandra Knapp, & Diana Percy**  
*Department of Life Sciences, Natural History Museum, London, UK*

The beetle genus *Leptinotarsa* Stal, 1858 has its centre of diversity in Mexico with a geographical spread south into Central America and north into North America as far as Canada. Some species are considered pests, most notably the Colorado potato beetle, *L. decemlineata*, is a serious pest of potato and has spread to parts of Asia and Europe via its association with the potato *Solanum tuberosum* L. In order to assess the utility of specimens in the collections of the Natural History Museum, London (NHM), for molecular analysis, we initially selected species with reasonably large numbers of specimens and a range of specimen ages. Specimen age ranged from 184 years old to 5 years old, with the bulk of the specimens collected during the 1930s- 1950s. Where possible, we used the most recently collected material, but the museum collection is relatively specimen poor for some taxa, obliging us to experiment with older material. We used a 'non-destructive' protocol and found that DNA extraction and subsequent sequencing success was greater using whole individuals incubated for 15-17 hours. Age of specimens did not determine sequencing success overall, suggesting that specimen preservation and storage is more influential. The mitochondrial gene region *cytB* was successfully sequenced for most species. Future goals include collaboration with researchers on a more comprehensive phylogeny using multiple gene regions, and investigating species distributions and host ranges over time using data generated from NHM collections digitization

Poster 4:       **The BMNH Chalcidoidea collection**

**Natalie Dale-Skey**

*Department of Life Sciences, Natural History Museum, London, UK*

From specimens collected by Darwin to the recently acquired Hedqvist collection, the Chalcidoidea collection of the London Natural History Museum holds a wide array of fascinating material. With material of more than 12,000 valid species and about 5000 primary types, it is one of the most important research collection worldwide. Now housed in an environment controlled environment and entirely databased, it is more than ever accessible for research

Poster 5: **The Psychodidae collections at the Natural History Museum, London (NHMUK)**

**Zoe J. O. Adams**

*Department of Life Sciences, Natural History Museum, London, UK*

The entomology collections held at the Natural History Museum (NHMUK) in London, are among the most important and impressive in the world. The museum no longer has a dedicated medical diptera section and now looks to the wider research community to work, in collaborate with the diptera curatorial team at the museum, to mine the wealth of data held in its Psychodidae collection. I hope that this overview of the collection, with details of coverage, types, and historical specimens, will renew interest in using this importance collection to facilitate current research. Indeed compilation of the data for this poster has highlighted the importance of the non-medical Psychodidae holdings at the museum, which though they do not rival the medical, in terms of overall numbers, contain an equivalent number of type specimens, as well as significant holdings of dry specimens which could prove amenable to modern DNA methods. All approaches will be considered; however an important plank of the museum's current science strategy is to digitize its collections, so projects which incorporate specimen digitization will be viewed favourably. The research community can gain access to the collection through our system of research loan.



## TALKS SESSION 1:

### **Digitization efforts**

8:40 am      **Databasing the Harry G. Nelson collection of North American riffle beetles (Coleoptera: Dryopoidea) at the Field Museum**

**Crystal A. Maier**

*Gantz Family Collections Center, Field Museum of Natural History, Chicago, IL, USA*

Former Field Museum curator and Roosevelt University professor Harry G. Nelson devoted his life to collecting riffle beetles and his collection is now part of FMNH Insect Collection. At last count (1993), the Harry G. Nelson collection of dryopoid water beetles comprised over 525,000 adult specimens, both pinned (~25,000 specimens) and in alcohol (~500,000 specimens), plus larvae, spanning over 6,000 field sites, making it one of the largest and most comprehensive collections of its kind for the upper midwestern United States and Canada. Mr. Nelson was ahead of his time as a collector, as he made meticulous notes of water conditions and carefully georeferenced every one of his collecting localities (using the best technology available to him at the time – wall maps). He also recorded absence data, which is critical for the construction of modern niche models, and this set of absence data makes the collection unlike any other of its age. Despite the enormous value of the collection, it is largely unknown to beetle workers and the data is locked away on paper field notes and on the labels of uncatalogued specimens. Work has begun at the Field Museum to digitize his field notes and wall maps and database and georeference this valuable and little-known collection.

Tweet your experience at the  
meeting with #EntColl2015



9:00 am

## **Putting the ghosts into the machine: Digitizing Field Notes at the UMMZ**

**Mark O'Brien**

*Museum of Zoology, University of Michigan, Ann Arbor, MI, USA*

The University of Michigan Museum of Zoology's Insect Division contains hundreds of field notebooks dating as far back as 1903. We often get requests to search for a particular set of notes by a collector or locality. In 2013, I initiated an effort to start digitizing the field notes for several purposes: to better preserve the integrity of the old notebooks; to be able to share the information more readily; and to be able to correlate data in the notes with the specimens in the collection. Over a two-year period, nearly 500 distinct sets of field notes within the University of Michigan Museum of Zoology's Insect Division were digitized, cataloged and read for metadata. The author discusses some of the obstacles and solutions to the digitization, and the resulting product of a PDF document linked to a File-Maker database. Unexpected revelations from the notebooks also provided some humor as well as answers to many questions. Future directions include the PDFs being linked to a Specify database and being made available for web searches

9:20 am

## **Digitization at the London Natural History Museum: recent projects involving the Chalcidoidea collection**

**Natalie Dale-Skey**

*Department of Life Sciences, Natural History Museum, London, UK*

An overview of several digitisation projects at the Museum, with a focus on digitisation of Chalcidoidea specimens. Two projects in particular, mass digitisation of slides (a pilot project involving a dedicated team of volunteers and several members of staff), and digitisation of types and historic specimens (a long term project done on a specimen by specimen basis), are compared both in terms of workflow and output.

9:40 am **TaxonWorks as a Collection Management Tool**

**Matthew Yoder, R. Edward DeWalt, & Dmitry Dmitriev**

*University of Illinois, Illinois Natural History Survey, Urbana-Champaign, IL, USA*

TaxonWorks is a new, open source effort to build a comprehensive suite of web-based tools facilitating individual and collaborative taxonomic research. Because taxonomists, in addition to collection managers, must manage specimen digitization and loan management, we have included within TaxonWorks a suite of tools that facilitate these tasks. This has pre-adapted TaxonWorks to be used as a full-fledged collection management tool. To simplify the digitization process of individual specimens we have developed a photo-based tool that utilizes a simply annotated stage. This includes the automatic isolation of metadata components and OCR prediction for transcription. Two collections are the first to adopt TaxonWorks as a collection management tool: the Illinois Natural History Survey, which is migrating over 800k records from its 20+ year old systems, and the Frost Museum, which is digitizing its odonates using the aforementioned photo-based approach. We discuss highlights and insights from the ongoing process of migrating these collections to a production ready status within TaxonWorks. With dedicated financial backing, the Species File Group (lead developers of TaxonWorks) intends to become a hub for the biodiversity informatics community and seeks to provide dependable, long-term support for collections management at multiple scales.

10:00–10:25 am **Coffee Break**



## TALKS SESSION 2:

10:25 am

### **The Hopkins Notes and Records System and its value for contemporary research**

**Robert R. Kula** (*Systematic Entomology Laboratory, USDA-ARS, Washington, DC, USA*), & **Floyd W. Shockley** (*Smithsonian Institution, Washington, DC, USA*)

The Hopkins Notes and Records System was used by the U.S. Forest Service from ~1899–1987 to document data pertaining to insects associated with woody plants in U.S. forests. What makes this early “database” unique and valuable is that it links collection, identification, and natural history data for insect specimens (e.g., herbivores and their natural enemies) on known host plants. Those data are stored on hundreds of thousands of notecards, as well as in a series of notebooks, at institutions throughout the U.S. One large set (the majority) of these cards and notebooks are housed in the Department of Entomology Original Documents Archive at the Smithsonian Institution National Museum of Natural History in Washington, DC (NMNH). Most of the insect specimens documented in the Hopkins system are located at the NMNH; they are associated with data on the cards through the use of unique Hopkins numbers. The Hopkins system thus contains a wealth of historical natural history data, including novel trophic associations useful for addressing contemporary research questions. The structure of the Hopkins system and the Smithsonian Institution’s efforts to digitize these card files are described. A research project using data in the Hopkins system is presented to demonstrate the value of the system.

10:45 am

## **Challenges faced in modernizing old specimen databases and getting them online**

**Andrew B. T. Smith**

*Canadian Museum of Nature, Ottawa, Ontario, Canada*

Specimen-level electronic databases have been around for over a quarter century. During that time, technological changes have happened quickly that much of the computer hardware and software we used even a decade ago is now obsolete. This sometimes results in old electronic files and databases being irretrievable. I will share my recent experiences in modernizing old specimen-level entomology databases and formatting them for internet distribution. The databases I have primarily worked with are in Mantis, FileMaker Pro, and Excel but the cautionary tales are generally applicable. I will also make some general comments and observations on how institutions treat specimen datasets and some of the internet resources available to disseminate specimen data.

11:05 am

## **Developing a long-term study in Costa Rica**

**Eugenio H. Nearns, Ian P. Swift, Gareth S. Powell, & Jennifer M. Zaspel**

*Purdue Entomological Research Collection, Department of Entomology,  
Purdue University, West Lafayette, IN, USA*

The Purdue Entomological Research Collection (PERC) recently initiated a long-term study of insects in Costa Rica. We share our experience in developing relationships with collaborators and permitting agencies in-country. We discuss the goals of the study, as well as the collecting/trapping methods employed at our four study sites. Finally, we introduce two new study abroad courses developed in conjunction with this study and offered by Purdue University's Department of Entomology. Enrollment for the first course, titled "Biodiversity and Conservation in the Tropics," has already begun and the first group of students will travel to Costa Rica in May 2016. The second course, focused on forensic entomology, is planned for May 2017.

11:25 am

## **Insects collecting in Cuba: recent experiences and outlook for the future**

**Robert Anderson**

*Canadian Museum of Nature, Research and Collections Division, Ottawa, Canada*

The current state of requirements for insect collecting in Cuba are summarized based upon experiences during three recent (2012, 2013, 2014) trips to the island. Collaboration with in-country scientists willing to accompany you at all times into the field is essential. They will co-ordinate the itinerary and arrange for all required permissions from the various government agencies. Native habitats are localized and often in protected areas for which permits are required and access may be difficult. There is an array of field stations and 'campismos' (small campgrounds renting cabins) scattered throughout the country, often adjacent to good habitats, in which free or inexpensive field accommodations may be arranged. Hotels are few (and often full) but accommodation in private houses can be arranged. Outside of large cities, restaurants are few and stores are often with little inventory. Meals can be arranged in private houses. Car rentals are expensive and limited (by number and type of vehicle). Roads are extensive and good, gas is readily available. Next to Canadians, Cubans are now the largest group of tourists in the country (thanks largely to access to external money) and are increasingly occupying hotels and taking available car rentals but also are creating demand for better local logistics. Collaborating individuals and institutions can arrange, coordinate and facilitate but you must provide for all costs associated with your visit. Gifts of work-related items and tips are welcome.

11:45–1:15 pm

**Lunch**

## TALKS SESSION 3:

### Using Digitized Insect Data in Research

Organizers: Gil Nelson, Christy Bills

1:15 pm      **Introduction to Using Digitized Data**

**Shelley James** (*iDigBio, University of Florida, FL, USA*), **Christy Bills** (*Natural History Museum of Utah, UT, USA*), & **Gil Nelson** (*iDigBio, Florida State University, FL, USA*)

Now that the National Science Foundation's Advancing the Digitization of Biodiversity Collections (ADBC) initiative is in its fifth year of implementation and the volume of digitized biological data produced by the program is expanding exponentially, the use of these data in biodiversity research and education is increasingly feasible and imperative for funding sustainability. Although research application of these data spans all biological and paleontological disciplines, the following series of talks focuses specifically on the use of these data in entomology and entomological research. iDigBio is pleased to co-sponsor this symposium with ECN and encourages the use of digitized data across the biodiversity sciences.

Save the Date!



September 24–25, 2016

1:35 pm

## **Digitization of the Beatty Odonata Collection at the Frost Entomological Museum (PSUC): the terrain of ecological niche modeling**

**Emily Sandall** (*Frost Entomological Museum, Penn State University, University Park, PA, USA*), **Claire Jones** (*Geographic Information Systems (GIS) Collaboratory, DePaul, University, Chicago, IL, USA*), **Briana Ezray** (*Department of Entomology, Penn State University, University Park, PA, USA*), & **Andy Deans** (*Frost Entomological Museum, Penn State University, University Park, PA, USA*)

The influx of locality data from entomological collections can lead to myriad applications in biogeography, particularly when utilizing meticulous collecting information from a single order. Throughout the 1940s–1960s, George H. and Alice F. Beatty collected approximately 60,000 Odonata specimens, with over 1,000 species represented. In 2005, the Frost Entomological Museum at Penn State acquired these specimens, which were primarily collected in Pennsylvania as well as over a series of trips to Mexico and South America, and their accompanying field notes. With the receipt of an National Science Foundation grant for digitization, we have been hard at work imaging these dragonflies and damselflies and compiling their location data. The digitized specimens will increase the quantity of georeferenced odonates in online databases as well as provide a more complete picture of taxa in underrepresented regions in Mexico. We used these data in an ecological niche modeling analysis to test George H. Beatty's hypotheses on the edaphic factors driving Pennsylvania Odonata.



1:55 pm

## **Using digitized fossil Coleoptera to study ecological and evolutionary response to global climate change**

**Dena M. Smith, Lindsay J. Walker, Cesar R. Nufio, & Hannah Sexson**

*University of Colorado Museum of Natural History, Boulder, CO, USA*

The University of Colorado Museum of Natural History (UCM) houses over 150,000 fossil insects from the middle Eocene Green River Formation (~49Ma) of western Colorado. Specimens come from multiple localities and span a time interval when there was a dramatic global cooling event. Insects are well represented, abundant, and diverse in all of the study localities. These fossil insects are being imaged as part of the Fossil Insect Collaborative TCN project, a National Science Foundation funded effort that supports the digitization of fossil insect collections from ten US institutions. The imaging aspect of this TCN project has allowed for easy access to specimens and facilitated new research on these important materials.

Through the use of digitized images, we have been able to conduct a study of fossil Coleoptera from two localities in the Green River Formation; one deposited in a warmer time interval and the other during a cooler interval. These images made it much easier for us to work with a great community of international Coleopterists who have helped us to make taxonomic identifications and gather ecologic data. With this information we have been able to analyze taxonomic composition, richness and abundance distributions through time. In addition, we have been able to measure body size directly from the specimen images to see if there have been shifts in beetle size that correlate with temperature shifts. While there was little change in overall levels of species richness, we did find shifts in community composition, likely reflecting beetle life history characteristics. In addition, beetles became significantly smaller as global temperatures cooled, which is consistent with modern body size gradients. As our digitization efforts expand to incorporate the imaging of insects from other fossil localities, including the famous late Eocene Florissant Formation (~34Ma), we will be able to test hypotheses about the duration, rate and magnitude of climate change and further examine how insects have responded in the past.

2:15 pm

## **Using Digitized Data: Two examples of North American museum collections**

**Christine A. Johnson**

*American Museum of Natural History, New York, NY, USA*

The collections in natural history museums around the world hold a snapshot in time of what was, what is, the actions of a collector and sometimes other associates of species and places that may no longer exist. Until recently, data associated with the specimens in these collections resided primarily in someone's notebook or perhaps in a publication, where verbatim collecting data or a personal reflection was described. Now, with the enormous effort in the last six years to digitize (database and image) our museum collections and associated materials, we have relatively easy access to what the collections hold and can start to formulate patterns of distribution, identify changes in distributions and understand various associations. Here I present two small examples using newly digitized data of historical North American museum collections to provide information on the ecology and host associations of treehoppers and the plant bug, *Reuteroscopus*.

2:35–2:50 pm **Coffee Break**

### **TALKS SESSION 4:**

**Using Digitized Insect Data in Research (continued)**

Organizers: Gil Nelson, Christy Bills



**BRILL**

2:50 pm

## **Areas of endemism in the Nearctic: a case study of 1,566 species of Miridae (Insecta: Hemiptera) and their plant hosts**

**Christiane Weirauch** (*University of California Riverside, Riverside, CA, USA*), **Randall T. Schuh**, **Katja Seltmann**, **Michael Schwartz**, **Christine Johnson** (*American Museum of Natural History, New York, NY, USA*), **Mary Ann Feist** (*Wisconsin State Herbarium, WI, USA*), & **Pamela Soltis** (*Florida Museum of Natural History, FL, USA*)

Areas of endemism (AOE), i.e. areas defined by the congruent distribution of taxa, are essential first steps in investigating historical biogeography. Compared to Central and South America, there is a surprising paucity of such hypotheses for the Nearctic region. In addition, AOE based on insects have not been proposed for the Nearctic. Miridae, the plant bugs, are an excellent taxon to study in this context because this group combines high species diversity, a history of modern taxonomic revisions and comprehensive electronic data capture, and often small distribution ranges, in particular in the Western Nearctic region. We here analyze datasets for Nearctic Miridae and their host plants that are based on specimen data generated or assembled during the NSF-funded Tri-Trophic Database ADBC Thematic Collection Network to address the following objectives: 1) Generate AOE for plant bugs based on parameters used by Escalante et al. (2013), a recent study of AOE for the Nearctic that is based on mammals, and compare hypotheses based on these datasets. Given the narrow distribution ranges of many species of Miridae, we predict that AOE are smaller and more numerous for Miridae, especially in the Western Nearctic. 2) Discuss hypotheses on AOE for the Nearctic based on Miridae in the context of AOE based on their host plants. Distribution ranges of Miridae are often smaller than those of their host plants and we predict that AOE defined by Miridae will also be smaller than those defined by host plants. We apply an optimality criterion method implemented in NDM/VNDM (Szumik & Goloboff, 2004) to several plant bug and plant datasets (different levels of strictness for endemism and minimum specimen record numbers), with the largest mirid dataset comprising 1,566 species and 61,784 specimen records. The plant dataset is derived from records for taxa known as hosts from a broad cross section of American herbaria. Different plant bug analyses result in between 12 and 45 AOE in the Nearctic, many congruent with previously proposed ecoregions and AOE, with the greatest diversity of areas in the Western United States and Mexico.

3:15 pm

## **Digital Databases and Multiple Perspectives of Biodiversity**

**Jorge Soberon**

*Department of Entomology, University of Kansas, Lawrence, KS, USA*

The field of Biodiversity Informatics has been defined as the digitization, visualization and analysis of primary biodiversity data. The meaning of the term “primary biodiversity data” may change depending on the perspective or point. From a phylogenetic point of view sequence data may be primary. From a morphological point of view, morphometric data may be primary. For biogeographic perspectives, occurrence data is primary data. Each one of these points of view has its own bioinformatics data repositories and analytic methods. Combining points of view, however, can be a major challenge both technically and conceptually. Digitized databases for different fields do not interact easily. In this presentation I describe some of the problems and review a few of the solutions, and argue that entomology will benefit significantly from a coordinated attempt to provide multi-perspective and interoperable databases

3:35 pm

## **Digitized data and the bees of Colorado**

**Collin Schwantes**

*Department of Ecology and Evolutionary Biology, University of Colorado Boulder, Boulder, CO, USA*

In conservation biology, it is essential to know the size of a population and where it can be found. To properly estimate population size and location, long-term and wide-ranging sampling must be conducted. Digitized collections provide invaluable supplemental sampling to improve estimates of population size and location. Using records in the Global Biodiversity Information Facility in combination with literature review, I was able to build a database with location, date, and natural history characteristics for the bee species of eastern Colorado. Using that database and two years of field sampling, I estimated population size and location for each species. Including GBIF records significantly improved model estimates. These estimations will help us refine conservation efforts for bees in eastern Colorado.

3:55–4:15 pm

## **Using Digitized Insect Data in Research Symposium Discussion and Wrap-Up**

4:15 pm

## **Collecting flies for genomic research: workflow at the Smithsonian National Museum**

**Torsten Dikow**

*Smithsonian National Museum of Natural History, Washington, DC, USA*

The National Museum of Natural History of the Smithsonian Institution recently set up a cryogenic collection facility called the Biorepository (<http://www.mnh.si.edu/rc/biorepository/>). The Biorepository is a novel cross-departmental collection of genome-grade material emphasizing the preservation of all organisms. It is tightly integrated with the Global Genome Initiative (GGI, <http://www.mnh.si.edu/ggi/>) and the Global Genome Biodiversity Network (GGBN, <http://ggbn.org>). This presentation will provide an introduction to the Biorepository, GGI's aim of preserving specimens collected by Smithsonian and non-Smithsonian scientists, and GGBN's aim to make these specimens available for research by the biodiversity community. Furthermore, it will provide an overview of a collection workflow developed based on the author's experience in preserving Asiloidea flies for current molecular research and most importantly for whole-genome sequencing.

4:35 pm

## **The archival quality of Gum-Chloral based slide mounting media; an accelerated aging experiment**

**Zoe J. O. Adams**

*Department of Life Sciences, The Natural History Museum, London, UK*

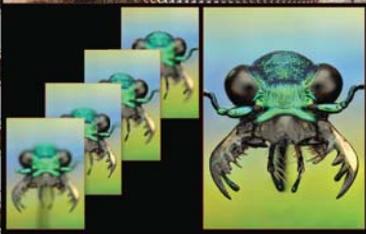
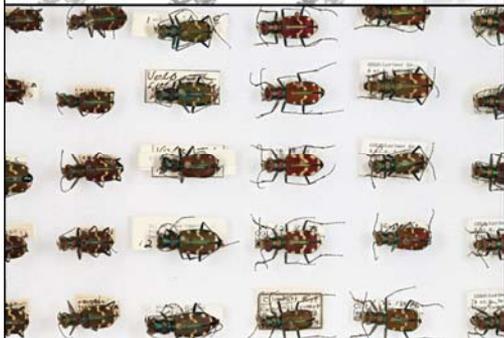
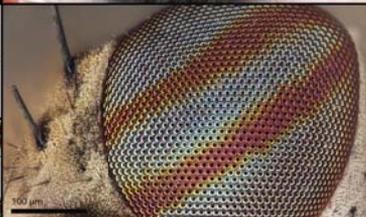
The problems with the stability of Gum-Chloral based slide mounting media have been widely reported, and include problems with the mounting media becoming crystallised, as well as apparently unrelated problems where mounts become increasingly discoloured until the mount is entirely opaque and black, in extreme cases. The reagents used in this study were chosen because they occur in protocols that have been used to generate several different slide collections held at The Natural History Museum, London (NHMUK). However the results from this study should have relevance for collections elsewhere, and offer useful data to those considering the use of such mounting media, as well those responsible for the care of historical collections made using this family of mounting media.



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5:30–6:30 pm

ECN Mixer, Poster Session  
(Authors present at posters), Minnesota  
Hyatt Regency Northstar A

6:30–9:00 pm

ECN Dinner, Minnesota Hyatt  
Regency Northstar A

ECN DINNER MENU

HOUSE SALAD WITH SLICED CUCUMBERS,  
SHREDDED CARROTS, AND CHERRY TOMATOES  
RANCH AND HONEY CHAMPAGNE VINAIGRETTE  
DRESSING

\*\*\*

ASSORTED WARM ROLLS WITH BUTTER

\*\*\*

VEGETARIAN LASAGNA

\*\*\*

BAKED CHICKEN MARINATED IN GARLIC OIL  
AND  
PARSLEY (DF,GF)

\*\*\*

BOILED, SEASONED POTATOES

\*\*\*

GREEN BEANS AND CARROTS

\*\*\*

CHOCOLATE CAKE WITH STRAWBERRY SAUCE

Notes:

## Sunday, November 15th, 2015

7:30–8:00 am

**Coffee**

8:00 am

**Welcome and Announcements**

### TALKS SESSION 5:

#### **Living Collections**

Organizers: Anthony Cognato and Steven Nichols

8:05 am

#### **The Insect Zoo at Michigan State University's Bug House**

**Bernice Bacon DeMarco & Gary L. Parsons**

*Department of Entomology, Michigan State University, East Lansing, MI, USA*

The Bug House is the centerpiece for outreach programs in the Entomology Department at Michigan State University, which impacts over 10,000 visitors per year. The facility has static displays of approximately 3000 pinned specimens from around the world and 20 species of live arthropods including cockroaches, beetles, assassin bugs, tarantulas, centipedes, millipedes, scorpions and vinegaroons, as well as an observation bee hive and indoor butterfly habitat.

The co-directors oversee the care of the animals with a student worker to feed and clean cages three times per week. Live specimens are chosen based on accessibility and species that do not require permits and that are easily and safely handled by our visitors and volunteer student guides. Since its opening, the Bug House has educated, thrilled and helped to dispel fears about insects to thousands of children and adult visitors. Many teachers bring their students year after year, because they see the value in learning about entomology through our outreach program.

8:25 am

## **Beyond *Drosophila melanogaster*: insights into a living collection of over 250 globally distributed *Drosophila* species**

**Maxi Polihronakis Richmond & Therese A. Markow**

*Drosophila Species Stock Center, University of California San Diego, San Diego, CA, USA*

The goals of the *Drosophila* Species Stock Center (DSSC) at UC San Diego are to provide 1) a repository for standardized biological resources for current and future generations of investigators and educators, 2) tools to perform manipulative empirical studies, not possible with preserved material, to inform practical applications, and 3) access to relatively inexpensive materials for engaging students in biology classrooms. The DSSC currently maintains a diverse collection of over 1600 living stocks from 250 *Drosophila* species. The scientific interests of our user base are broad and include questions in the disciplines of evolution, ecology, behavior, developmental biology, physiology, neurobiology, comparative genomics, and immunology. The availability of whole genome sequences for over 30 *Drosophila* species has added additional value to the genus *Drosophila* as a model for comparative studies investigating correlations between phenotypic change, genome evolution, and species divergence.

8:45 am

## **Metamorphosis of a Bug Barn**

**Gwen Pearson**

*Department of Entomology, Purdue University, West Lafayette, IN, USA*

How many live insects do you need to make a “Bug Zoo” a working outreach tool? How onerous is the USDA PPQ inspection process? Should small children be allowed to handle tarantulas? All of these are questions a new manager of an educational outreach facility might face. I’ll discuss how I try to find a planning process and answers that work for us at Purdue.

9:05 am

**OSU Insect Adventure: a living collection  
in action**

**Andrine Shufan**

*Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, OK, USA*

The OSU Insect Adventure is Oklahoma's only living educational arthropod petting zoo and one of approximately 120 arthropod zoos in the US. Over the past 13 years, the Insect Adventure program has grown to provide more than 500 annual outreach presentations utilizing 75 species of arthropods and still is constantly developing. The challenges and joys of managing a large live collection that goes hands-on with the public year-round will be discussed.

9:25–9:45 am **Coffee Break**

9:45 am

**Audubon Butterfly Garden and  
Insectarium: A place where history and  
tradition meet diversity and wonder**

**Steven Nichols & Jayme Necaise**

*Audobon Butterfly Garden and Insectarium, New Orleans, LA, USA*

New Orleans is home to many extraordinary things, top among them is the Audubon Butterfly Garden and Insectarium. The idea for an insectarium was pitched in 1991. Challenges were met throughout its development, including: opposition from residents at the outset, the preservation of an historical structure, and later Hurricane Katrina. In 2008, after 17 years of development and delays the Insectarium opened its doors to visitors in an old federal building in the center of town. It houses invertebrates ranging from tarantulas and scorpions to beetles and butterflies. Today, the Audubon Butterfly Garden and Insectarium is the largest stand-alone institution of its kind in the country.

10:05 am

## **What are we collecting for?**

**Max Barclay**

*Department of Entomology, British Natural History Museum, London, UK*

The importance of natural history collections is self-evident to us, but can sometimes be difficult to explain. Although natural history museums can be as popular as art museums, and the intrinsic value of art is rarely questioned, there is still a tendency to justify natural history collections in purely utilitarian terms, for example as tools for current issues like food security or climate change. Such explanations are easy, and may be what people and funding bodies 'want to hear', but are simplistic and can risk reducing the perceived value of collections, if solutions are found elsewhere, or are not forthcoming. Collections have survived and stayed relevant through many changes in the cultural, social and scientific landscape. We should take care not to lose sight of our fundamental roles, as repositories of specimens and information, where the world's biodiversity is archived, assembled, preserved and made accessible for present and future study. If we want to maintain and grow our collections, we should attempt to explain their real purpose and potential, instead of giving 'soundbites'. I discuss my experiences with communicating the value of collections to different audiences.

10:25 am

## **Got Metadata? GBIF Task Force on Accelerating Discovery of Biological Collections Data**

**Deborah Paul**

*iDigBio, Florida State University, Tallahassee, FL, USA*

How can we all help to speed up discovery of the world's natural history collections? Metadata. An international group convened by The Global Biodiversity Information Facility (GBIF), is working on documenting strategies and models that work to support collections digitization and data discovery. This task force is reaching out worldwide and plans to disseminate findings that will suggest next steps for increasing the visibility of collections data and help collections and institutions set digitization priorities. Robust metadata about collections is key to this effort.

- 11:00-11:10 am      **ESA's Formal Policy Statement on Entomological Collections**  
Phil Mulder, 2015 ESA President
- 11:10–11:40 am      **Round Table Discussion**  
Panel Members: Katrina Menard,  
Mike Ivie, Max Barclay
- 11:40–12:40 pm      **Business Meeting**

### **Acknowledgments**

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