



The Ohio State University

Museum of Biological Diversity

Newsletter
Summer 2012

Newsletter

Editor: L. Musetti

Collections and the University mission

Norman Johnson, Director, Triplehorn Insect Collection

Back in the day, when departments in the biological sciences were organized along taxonomic lines – animals in the zoology department, plants in the botany department, insects in the entomology department, anything smaller in microbiology – many universities around the country maintained collections of specimens. These were primarily used for instruction, particularly in identification courses that were commonly offered.

The mission of research universities like Ohio State encompasses not only *teaching*, but also the *discovery* of new information and *understanding* of the world, as well as *service*, the application of that knowledge to our stakeholders in the state, country and around the world.



PHOTO: M Kibbey

records of the distribution of biodiversity in both space and time. Specimens are shared through study loans to researchers in all corners of the world, and the extent of the holdings in the collections and the data associated with them are increasingly being digitized and distributed electronically. Currently, over **460,000 records** from the EEOB collections are distributed through the Global Biodiversity Information Facility (<http://www.gbif.org/>), a global biodiversity information clearinghouse, and by the individual collections' websites (accessible at <http://mbd.osu.edu/collections>). At the same time our holdings continue to grow through the research activities of faculty, staff and students in Ohio, the USA and abroad.

Far from the stereotype of a dark, dank and dusty museum, the collections are a beehive of activity in which the latest advances in molecular biology, ecology, and information technologies are applied to understand the evolution of the world's biodiversity and to promote its conservation. I see the *MBDNewsletter* as a great vehicle to communicate the work we do to our colleagues in the department and the University. In this issue of the newsletter, the main focus is "collections and student workers". Staff and students write on the importance of student work to the mission of the collections and how, in turn, the collections contribute to the education of our undergraduate student workers. The stories illustrate first-hand what some of the students are working on and their impressions of the experience. ♣



PHOTO: E Dale

Today, not only have administrative organizational charts changed, but biology itself has undergone dramatic transformations. As a result biological collections have disappeared from many institutions, but for those that remain their mission has grown along with that of their parent institutions. Teaching remains a critical component, of course.

The collections at Ohio State in the *Department of Evolution, Ecology and Organismal Biology (EEOB)* are used in courses in ecology and evolution, as well as taxon-centered offerings like local flora, ichthyology, ornithology, mammalogy, acarology, and entomology. Both graduate and undergraduate students conduct individual research projects in the collections, relying on the specimens as documented

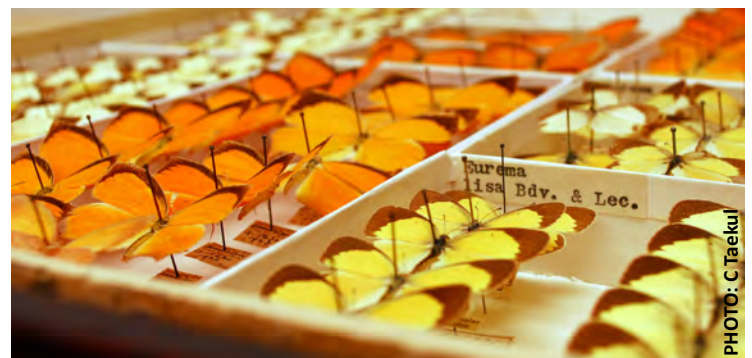
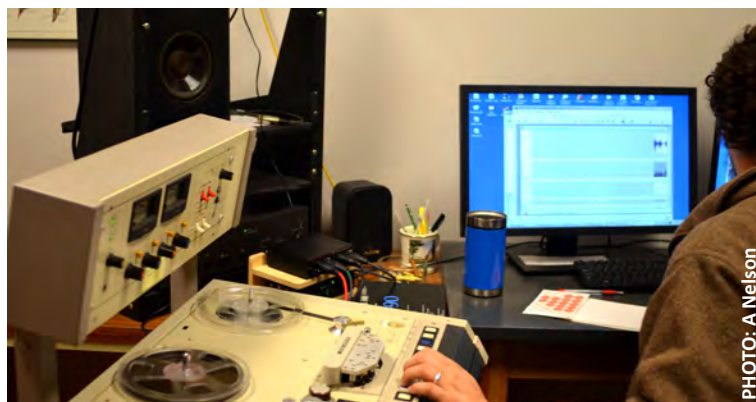


PHOTO: C Taekul

Student contribution to the collections

Angelika Nelson, Curator, *Borrer Lab of Bioacoustics & Tetrapod Division*

Work in the collections by undergraduate students is fundamental to the success of both the **Borrer Laboratory of Bioacoustics** (BLB) and the **Tetrapod Division**. Students commonly allocate 10-15 hours per week to work in the collections where they help with curatorial tasks, in particular the accession of new specimens. Here are some examples of their work:



Student digitizing bird recordings at the BLB.

In the BLB on average 2 students are employed each quarter to digitize animal sound recordings. For this, students are trained in the process of digitizing sounds from various media and entering metadata into a database. The work requires students to be computer savvy, show attention to detail and perform independently under general supervision. Often entering data related to the recordings turns into detective work; students look up detailed information on the location of the recordist based on the recordist's notes which are sometimes not as accurate as one would hope. Online tools such as Google maps are immensely helpful for locating specific descriptions. A highlight of a student's work day is when a new species can be added to the database. Currently the BLB holds recordings for 1,257 bird species with a focus on the Americas. Any tape recorded in Africa or Asia is very likely to add a new species.

Recently Laurel Cope digitized a collection of recordings from captive birds. As part of this project she obtained information for each species where it occurs and what its conservation status is in the wild. Thus students do not only learn the technique of digitizing but also have to dive into world geography and learn about the biology of recorded animals.



(L-R): Stephanie Malinich with hellbender; tray with warblers in the Tetrapod Collection; Sarah Focht with wood warblers.

The Tetrapod collection has been greatly improved through work of four undergraduate students in the last two years. Joshua Cano, zoology major, was funded by the Ohio Division of Natural Resources to re-organize the mammal collection in summer 2011. He did this diligently and almost finished all 5,000 specimens in the 3-month period. Andrew Scherrer, zoology major, finished the task and in addition cataloged a teaching collection of mammals. This collection will now be easily accessible for future use in OSU courses.

In spring 2012 Stephanie Malinich, Evolution and Ecology major, took on the task of opening some old crock storage pots with reptiles and amphibians that needed to be split up into glass jars and refilled with ethanol. Many of the specimens were not stored according to taxonomic grouping but rather by size. Thus Stephanie familiarized herself with the latest taxonomy of amphibians and reptiles for this project and split the specimens into appropriate groups.

Sarah Focht, an OSU major in Forestry, Fisheries and Wildlife, has been fundamental for the bird collection as she has been acquiring curatorial skills in the last two years. She is in the process of re-organizing the bird collections: she has established a teaching collection of over 1,000 birds and has now started re-organizing the main collection of more than 17,000 birds. ♣

From Student Intern to Collection Manager

Clarissa Bey, Collection Manager, Division of Molluscs

In February of 2008, my sophomore year winter quarter was coming to a close and I was beginning the search for an internship. I received an e-mail from my advisor about internship opportunities at the Museum of Biological Diversity. I had only been there once before, but it seemed like it would be an interesting place to intern and the flexibility to work around my class schedule appealed to me.

I was excited to receive an e-mail back from Dr. Watters in the ***Mollusc Collection*** and, after a meeting and a tour, we decided that I would begin my internship in the bivalve range that spring quarter. I had no previous knowledge of freshwater mussels, but I learned so much that quarter. When the quarter came to a close, Dr. Watters informed me that his student employee was graduating and a position would be opening in the fall. I jumped on the opportunity, because it was a place where I could continue learning while I worked.

The next spring, I had the opportunity to have an internship at the Columbus Zoo Freshwater Mussel Conservation and Research Center, where Dr. Watters is the science director, while continuing to work as a student employee at the Museum. This allowed me to expand my knowledge and learn about an aspect of the conservation and research work being done on these fascinating animals.

I continued to work through the summer, and was trusted with more responsibilities when the collections manager was preparing to go on maternity leave. In the fall Dr. Watters offered me the position under the condition that I graduate with my B.S. in Zoology that fall quarter of 2009 as planned. The day after graduation, I was fortunate enough to begin my career in a field that I once knew nothing about but was now very interested in.

Over the last couple of years, I have had the chance to work with 32 other interns, student employees and volunteers that have come through the Division of Molluscs. They have come from different backgrounds and these internship and student employee programs have helped all of them to go on and to pursue many different career paths. ♣

Lessons from the digitization project in the Herbarium

Brandon Sinn, GRA-EEOB, Herbarium

Undergraduate student workers supported by The Ohio State University ***Herbarium's*** NSF-funded databasing project gain valuable experience and knowledge unexpectedly. The first realization that students often make when beginning work in the Herbarium is that the collection is much more than "a library of plants." They soon realize that the collection is more like a single text which is constantly edited and added to, and more than this, a text which is rather valuable to researchers the world over.

Countless hours of work performed by student workers forms the core of the digitization project. Students have the tendency to trivialize what they do, but when presented with the data they have captured, interpreted, and entered, they often realize that their work is much more valuable than imagined earlier.

When prompted to write this piece, I asked students what they had learned while employed by the Herbarium. Two of the overwhelmingly popular answers were interpreting 100 year old handwriting, and learning the counties of Ohio. However, there is more to this response than one might think. The great majority of plant specimens in the collection from Ohio are greater than 50 years old. This means that locality data and handwriting must be interpreted from oftentimes fragile specimens. The fragility of these specimens requires that they be handled with the utmost care, and students gain curatorial skills which are not taught in their courses. Most labels on specimens of this age class contain sparse or 'outdated' information. Students need to know much more than the Ohio counties in order to properly geo-reference collections in a modern framework. They must be able to correctly decipher 'archaic' penmanship, search for and subsequently memorize place names which are no longer in use, and more often than not, work together to be "herbarium specimen detectives". Being able to show initiative and to work efficiently with coworkers in order to solve work related problems is a major asset, one of which is gained or honed by students working on this project.

This student effort, when done carefully and conscientiously, extracts vast amounts of data ranging from phenology,



Clarissa Bey at work.

PHOTO: C Bey



Imaging plant specimen at the Herbarium.

PHOTO: A Nelson

species richness, evenness, and historical, distributional, and genetic changes which are just now starting to be utilized to a fuller potential. The students in the Herbarium understand their role in this, and when presented with the end point of facilitating scientific discovery through their imaging and typing, they find it to be meaningful. ♣

A High School Student Experience

Zachary B. Zerkle, The Graham High School, Herbarium

My experience at the Ohio State University **Herbarium** was fantastic! It was such an educational experience that not very many people get the chance to do. I enjoyed working with Mesfin Tadesse, Jeff Rose, Cynthia Dassler and others. I've been working with Dr. Tadesse for a few months now, coming in on Tuesdays and Thursdays for my High School Internship. I got a little taste of all the work aspects in the Herbarium. I got to sort and ship plants to other Herbariums with Dr. Tadesse. I got to work with fossils with Dr. Dassler. I got to mount Plant specimens with Donna Schenk. I even got to document plant specimens from 1877, wow! I got to pitch in a hand with setting up for this year's Open House. The workers in the Museum of Biological Diversity building were funny, educational and nice. I never once ran into a problem with any of them. They are all very kind and I thank you for that. I really enjoyed my stay here and if I could do it again I would. Thank you Mesfin for giving me this amazing opportunity to experience what it is like to work in a herbarium. ♣

What's that buzz? – student assistants in the insect collection

Luciana Musetti, Curator, Triplehorn Insect Collection

The **Triplehorn Insect Collection** has been employing undergraduate student assistants regularly for 12+ years. Students work in all aspects of the curatorial process, from field collecting, sample sorting, specimen preparation and label data capturing to collection cataloging, organization and use. Recently we also started involving the students in our specimen loan process. Their contribution is invaluable to the collection.

Our student assistants tend to stay for several quarters, and some have stayed for multiple years. Five have successfully moved on to postgraduate programs after learning the principles of scientific research in our collection. Two have joined the collection as permanent staff after graduation and are still with us today.

Students have come from a wide variety of majors (biology, computer science, engineering, architecture, wildlife management, art technology, political science, geology, nursing, history, journalism, physics, psychology, among others), cultural and ethnic backgrounds (including Hawaiian, Indian, Syrian, Egyptian, South Korean), and personal interests (film-making, photography, martial arts, songwriting, rock climbing, skate boarding, fiction writing, athletics, just to name a few). This diversity makes for an enriching (and fun!) work environment, where students learn from each other and from the faculty, staff and graduate students they interact with.



Preparing specimen holding trays. Undergrad assistants Mike Cassidy & Liv Vincent.



Setting up insect traps. Elijah Talamas (GRA), Zach Hurley (UA), Sara Hemly (Curatorial Technician), Matt Elder (UA), Emily McDermott (UA) & Charuwat Taekul (GRA).

Over the years, we have consistently employed young women, in fact, the vast majority of our student assistants have been women (27 ladies:18 gentlemen). We have also had high school summer interns working in the collection, including students funded through an NSF "Research Assistantships for Minority High School Students" supplement.

The work experience in the collection provides the students with an understanding of the operation of a research collection, as well as the role and value of natural history collections for science, conservation, education, and the community at large. Besides insect collecting, curatorial techniques and specimen data capture, students have the opportunity to learn about taxonomic and systematics research, digital imaging, and a fair bit about geography and current affairs. Moreover, actively working with collection staff and with other students helps them to develop interpersonal, organizational and collaborative skills that they will certainly be able to apply to their future careers and personal life. ♣

Learning invaluable job skills

Josh Grant, Undergraduate Student Assistant, Triplehorn Insect Collection



My journey into the world of entomology began with a general entomology class that I took as an elective. In this class I discovered that insects not only were extremely fascinating, but that they also provided a unique medium to learn more about medicine, which is the career path that I have chosen. During the class I was told about a job opening at the **Triplehorn Insect Collection** and I thought: "I could use a good part-time job, and why not have the added bonus of working with insects". Now, after working here at the Insect Collection for almost two years, I can definitely say that the experience has been a bonus to my life.

My position is that of undergraduate assistant and as the name implies, I am an undergrad student and I get to assist in the day to day activities here at the collection. This position provides several skills that any student can use in their future career, whatever that career choice may be. I thought that I had learned all there was to organization after being in the Marines, but curating the collection takes organization to a whole new level.

Managing several million specimens and providing the public with the vast knowledge therein is a daunting task, but it is a challenge that students can look to as to what they should be working to achieve. Organization is a very useful skill and one that every student (undergrad or grad) should possess once they graduate. The position has also reaffirmed to me the importance of attention to detail. One cannot haphazardly handle the century old specimens in the collection and so with great care the students are instructed into the proper handling of the specimens and also in paying attention to the task at hand. These are not the only skills that one can gain from an undergrad assistant position; being on time and managing a schedule along with other basic professional skills can also be gained.

In my mentioning of my time in the Marines, I let slip my age and so I would like to say to all the students reading this to take advantage of opportunities such as this, your time as a student is very short, and to all the professors and curators, I would like to say thank you for giving students the chance to be paid to learn the job skills that they will need to succeed in their career. Seriously, thank you, your patience saves a lot of future employers a ton of headaches. ♣

News & Updates

▪ **Acarology.** For three weeks earlier this summer (June 25-July 13), the halls of our fine building were clogged by hordes of acarologists chasing after the elusive duplex seta, confusing lamellae with costulae, and desperately looking for coffee (and a bathroom). In other words, the 61th successive edition of the **OSU Acarology Summer Program** was in full swing. This year we conducted two workshops, *Medical-Veterinary Acarology* (2 weeks) and *Soil Acarology* (3 weeks), running in parallel. The workshops are intensive, a typical day starting at 8:30 AM and ending around 8 PM, except on Saturday (end 5 PM) and Sunday (start 1 PM). We did suspend some of the program briefly during the June storm due to excessive fire alarms, but working in the back class room with the door closed was possible, and continued.



Soil Acarology had 16 participants (5 from the United States, none from Ohio State Univ.), and Medical-Veterinary Acarology 21 participants, up to 25 during our "tick week" (21 from the USA, 5 from OSU). International participation was once again excellent with 15 participants from outside the USA, representing Argentina, Australia, Brazil, Canada, Colombia, France, Germany, Israel, Netherlands, New Zealand, and Turkey.

Guest lecturers included Lorenza Beati (Georgia Southern University, Statesboro), Valerie Behan-Pelletier and Frederic Beaulieu (Agriculture and Agri-Food Canada, Ottawa), Ashley Dowling (Univ. Arkansas, Fayetteville), Roy Norton (SUNY,

Syracuse), Ronald Ochoa (SEL, USDA, Beltsville), Barry OConnor (Univ. Michigan, Ann Arbor), David Walter (Royal Alberta Museum, Canada), and Cal Welbourn (Florida State Collection of Arthropods, Gainesville). Sam Bolton was TA; George Keeney and Corey Ross helped with logistics. Glen Needham and Hans Klompen co-organized the program and lectured in Medical-Veterinary Acarology.

For 2013 we will offer *Introductory* (1 week) and *Agricultural Acarology* (2 weeks), which will run consecutively. Given the semester conversion we may change timing, but otherwise we are getting ready for year 62. (H. Klompen)♣

▪ **Borrer Laboratory of Bioacoustics (BLB) & Tetrapod Division.** The *Ohio Bird Conservation Initiative* under the lead of Amanda Conover finished the spring collection of bird casualties for the project "Lights Out Columbus". We received a total of 29 birds, 3 have already been prepared into museum skins and been accessioned into our permanent collection. Among the birds were 6 species of wood warblers (Bay-breasted Warbler, Black-and-white Warbler, Common yellowthroat, Kentucky Warbler, Ovenbird, Tennessee Warbler) and other migratory birds such as yellow-bellied sapsucker, gray catbird, brown creeper, indigo bunting and even a yellow-billed cuckoo. All birds were collected in the Columbus Downtown area (south of Nationwide Blvd, north of E Main St, east of the Olentangy River, west of I-71) between 22-Mar and 23-May, 2012.



To further investigate the impact of extensive lighting on tall buildings in Downtown Columbus on migratory bird species at night collection of dead birds will start again on August 15th to capture fatalities during fall migration. If you are interested in volunteering for the project, visit <http://www.obcinet.org/volunteer.php>.

The new websites for the OSU's **Tetrapod Collection** (<http://www.tetrapods.osu.edu/>) and the **Borrer Laboratory of Bioacoustics** (<http://www.blb.osu.edu/>) are now available. Check them out!

Jonathan Maupin, an Ohio State Alum and artist, visited the Tetrapod collection to take photos of animal skulls for his photographic endeavor entitled "Osteography."

Statement by the artist: "Every skull has a story. They speak loudly and with authority on an array of topics ranging from the philosophic to the economic. This raises an interesting opportunity to explore their ability to tell the life story of an animal, to tell a human tale connected with the finding or harvesting of the skull, or to tell a tale that is a small part of a much larger narrative that may, or may not, involve those of us that still have skulls in our living bodies. The photographs invite the viewer to invent a story." (A. Nelson)♣



▪ **Fish Division.** Marc Kibbey has been mentoring an REU (Research Experience Undergraduate) student at the OSU Franz Theodore Stone Laboratory. The focus for Marc with the REU over the past three years has been collections maintenance with the goal of bringing the Stone Lab research, teaching and hands-on fish collections into proper shape, and making the collections and their associated data available to researchers for use in ichthyological projects.

There are several valuable gems located in the collections at Stone Lab, including the first ever record of the invasive tubenose goby, *Proterorhinus marmoratus*, from the Ohio side of Lake Erie, several collections of marine fish species from Milton Trautman's expeditions outside Ohio and some outside of the United States, and a blackstripe topminnow, *Fundulus notatus*, collected along the shores of South Bass Island. This last find is one of several fish species that have made their way into the estuaries of inland Lake Erie drainage streams, their usual habitats, and followed currents to the islands near Port Clinton. This year the undergraduate experience was focused on rearranging the Stone Lab collections in phylogenetic order. The student, Marissa Ganz, benefited from learning about taxonomic characters that determine phylogenetic placements of fish, as well as collections maintenance sciences.

There are new records collected by Stone Lab instructors and researchers for the tubenose goby that document increased numbers for the species in proportional abundance to the other percomorph piscine invader from Europe; the round goby, *Neogobius melanostomus*. In the last couple of years the tubenose goby has increased in abundance to the point where in some localities with favorable habitat (areas with aquatic macrophytes) the numbers match or exceed those of the round goby. The continued relationship with the Stone Lab collections and personnel will provide ongoing

documentation of the fishes of the waters near the islands that has been lacking in recent decades and will include some of the streams in north central Ohio.

Along with other innovations and techniques our Cataloging Coordinator Charles Wentzel has developed to improve our operations, he has recently generated tools for our database that facilitate searching for records. The tools can be found on our Fish Division front page at <http://www.biosci.ohio-state.edu/~paleoich/>. The first of these tools enables large scale searches of cataloged vouchers in the database by OSUM number, an option that was not previously available. The second enables the searcher to find the species within the clades that are represented in the OSUM collections. (Marc Kibbey)♣

▪ **Triplehorn Insect Collection.** We recently (19 May–7 June) had the pleasure to host our friend and collaborator, Dr. Andrew Austin. Andy is a professor at the University of Adelaide, Australia and co-PI, with Norman Johnson, on the *Platyastroidea Planetary Biodiversity Inventory Project (PlatyPBI)*, a 5-year, multi-million dollar project funded by the NSF. Over the last 6 years, Andy's visit to OSU has become an annual event that we look forward to. The primary focus of this visit was to work with Dr. Alejandro Valerio and Dr. Roger Burks, both *PlatyPBI* post-doctoral associates, on taxonomic revisions they are collaborating on.

Congratulations!! On June 14 *Charuwat Taekul*, graduate student in Norman Johnson's lab, successfully defended his Ph.D. dissertation. Charuwat's studies here at Ohio State have been supported by a fellowship from the Thai government. His thesis has three major components: taxonomic revisions of two genera – *Platyscelio* (published) and *Oxyteleia*, and a phylogenetic analysis of relationships within the subfamily Telenominae with the use of molecular characters.



L-R: Norman Johnson, Hans Klompen (back), Charuwat Taekul, Meg Daly and John Freudenstein.

research program and, more importantly, funding lined up for the first few years. (L. Musetti)♣

▪ **Herbarium.** This year's joint meeting of a number of plant systematics and ecology societies ("*Botany 2012*") occurred here in Columbus from July 7-11. Last held in Columbus in 1987 at which time it was conducted on the OSU campus, this year's botany meeting was located at the Hyatt Regency/Columbus Convention Center. EEOB faculty, staff and students were well-represented and Museum individuals were heavily involved. John Freudenstein, Andi Wolfe and several of their students (Paul Blischak, Michael Broe, Ryan Folk, Dan Roberts, Jeff Rose, Brandon Sinn, Aaron Wenzel) gave a total of 8 presentations. Cynthia Dassler and Herbarium Visiting Scholar Barb Andreas led a bryophyte field trip to the Hocking Hills on Saturday the 7th (in 100+ degree heat), while John led a tour of the Herbarium for visitors on Sunday morning. John was also local representative for two societies (American Society of Plant Taxonomists and Botanical Society of America), while Andi began her term as Secretary of the Botanical Society of America. Our students participated in workshops on in-situ hybridization techniques for cytogenetics and on "next-gen" DNA sequencing.

An OSU "reunion" was held at the meeting where a number of botany-area alumni and current staff and students got together to catch up. Staff from the Triplehorn Insect Collection generously supervised the Herbarium while our people were at the meeting so that conference attendees could also use the collection, which they did. Just after the meeting, former MBD and Herbarium Director Tod Stuessy visited the Herbarium and Museum, which kindled many memories for him of his time here as a faculty member in the 1980's and 1990's. Tod is currently Professor at the University of Vienna, Austria, where he has been for many years after retiring from OSU (where he is Professor Emeritus). (J. Freudenstein)♣



Andy at OSU's greenhouse with the giant flower of the titan arum (*Amorphophallus titanum*) plant.

The thesis committee was composed of Norman Johnson (advisor), Hans Klompen, Meg Daly and John Freudenstein. Charuwat is scheduled to return to Thailand in August, where he has a position in the Department of Agriculture. He already has a



Recent Publications

- Burks, R. A. 2012. Formation of family group names using the stem of -gaster, with special reference to names based on *Miscogaster* and *Sphegigaster* (Hymenoptera: Chalcidoidea: Pteromalidae). *Zootaxa* 3389: 61-64.
- Seltman, K.C., M.J. Yoder, I. Mikó, M. Forshage, M.A. Bertone, D. Agosti, A.D. Austin, J.P. Balhoff, M.L. Borowiec, S.G. Brady, G.R. Broad, D.J. Brothers, R.A. Burks, M.L. Buffington, H.M. Campbell, K.J. Dew, A.F. Ernst, J.L. Fernández-Triana, M.W. Gates, G.A.P. Gibson, J.T. Jennings, N.F. Johnson, D. Karlsson, R. Kawada, L. Krogmann, R.R. Kula, P.L. Mullins, M. Ohl, C. Rasmussen, F. Ronquist, S. Schulmeister, M.J. Sharkey, E. Talamas, E. Tucker, L. Vilhelmsen, P.S. Ward, R.A. Wharton and A.R. Deans. 2012. A hymenopterist's guide to the Hymenoptera Anatomy Ontology: utility, clarification, and future directions. *Journal of Hymenoptera Research* 27:67-88.
- Watters, G.T. 2012. Hispaniolan Annuliariidae (Gastropoda), primarily from the Barahona Peninsula: New taxa and notes. *Nautilus* 126: 1-14. ♣

Recent Presentations

- Broe, M. & J.V. Freudenstein. "The role of molecular evidence in delimiting groups with reduced morphology: a case-study from the monotropoids." *Oral Presentation. Botany 2012*, Columbus, OH, 9 July.
- Folk, R. & J.V. Freudenstein. "Reticulate evolution and phylogenetic relationships in the genus *Heuchera* (Saxifragaceae)." *Oral Presentation. Botany 2012*, Columbus, OH, 11 July.
- Freudenstein, J. "A supermatrix analysis of the large orchid subfamily Epidendroideae." *Oral Presentation. Botany 2012*, Columbus, OH, 11 July.
- Rose, J. & J.V. Freudenstein. "Unclogging the pipes: integrative species delimitation in *Monotropsis* (Ericaceae)." *Oral Presentation. Botany 2012*, Columbus, OH, 9 July.
- Sinn, B. & J.V. Freudenstein. "Analysis of complex floral shape in Appalachian *Asarum*: a journey without landmarks." *Oral Presentation. Botany 2012*, Columbus, OH, 11 July. ♣

Field Work & Research Travel

Fish Division - Spring/Summer 2012 field work results – West Fork of the Whitewater River heads up in Darke County, Ohio, and runs southwest into Indiana to join the East Fork in Franklin County, Indiana, from where it runs southeast to join the Great Miami River in the southwesternmost corner of Ohio. It is in Ohio's small stretch of the Whitewater River mainstem that the the Fish Division's sampling "crew of two", Brian Zimmerman and Justin Baker, found several specimens of the state endangered **northern madtom**, *Noturus stigmosus* (right).

There is one distribution dot showing that Milton Trautman documented the species in the Whitewater River in his 1981 "Fishes of Ohio", and one specimen was collected by the Ohio EPA's surface water crews in 1995.

Justin and Brian have also reconfirmed the presence of northern madtoms in historical localities of the Muskingum River, based on a U.S. Fish and Wildlife study conducted from 1982-1984 by OSUM Curator Emeritus Ted Cavender. Other entities had sampled these localities and



Mountain madtom, *Noturus eleutherus*.

Fellowships & Current Grants

- Beati, L, H Klompen, L Durden & NF Johnson. "REVSYS: Exploiting a large existing resource for biogeographical and host-parasite data: linking immature and adult amblyommine ticks. National Science Foundation DEB, **\$298,865**. (OSU Subcontract). 2010-2013.
- Fish Division**. "Freshwater Fish Inventory and Distribution project." Under the *Ohio Biodiversity Conservation Partnership*. We will synthesize existing records from the Fish Division with records from the ODOW, OEPA and other sources. The results will guide new collection efforts to generate an accurate and current record of freshwater fish distributions in Ohio, which will be used to help direct future research and management efforts. **\$83,356**. 2011-2012.
- Nelson, DA, A Nelson**, DW Steadman & T Webber. Digitization of recorded sounds in the Florida Museum of Natural History, NSF, **\$466,000**. 2009-2012.
- Nelson, DA, A Nelson**, HL Gibbs & JW Olesik. Co-Principal Investigators. "Digitization of recorded sounds in the Florida Museum of Natural History," National Science Foundation, DBI-0846354, REU Supplement. **\$5,998**. 2010-2012.
- Freudenstein, J.V.** "Systematics of Monotropeoideae and Pyroloideae (Ericaceae)." National Science Foundation, 2009-2012.
- Freudenstein, J.V & M Tadesse**. "Databasing of the Ohio Flora at The Ohio State University", National Science Foundation, 2009-2012.
- Johnson, NF & AD Austin**. "PBI: Diversity and the parasitoid life-history strategy — the superfamily Platygastridae (Hymenoptera)", National Science Foundation DEB, **\$2,600,000**. 2006-2011.
- Johnson, NF**. "Fine-grained semantic markup of descriptive data for knowledge applications in biodiversity domains". National Science Foundation, **\$50,490**. (OSU Subcontract). 2010-2012.
- OSU Herbarium**. "Digitization TCN Collaborative Research: North American Lichens and Bryophytes: Sensitive Indicators of Environmental Quality and Change", collaborative with multiple institutions, National Science Foundation, 2011-2015. ♣



PHOTO: M Kibbey

Northern madtom, *Noturus stigmosus*.

their vicinities in the Muskingum drainage in the interim, but they had not found the northern madtom, only the very similar looking and state threatened **mountain madtom**, *Noturus eleutherus* (left).

The Fish Division sampling crew completed their survey of glacial lakes in Ohio by travelling over several weeks in the spring to the western side of Ohio. Their efforts continued to document a decline in some of the glacial lakes

that was illustrated by failure to find Iowa darters, *Etheostoma exile*, and lake chubsuckers, *Erimyzon succeta*, in some of the glacial lakes/ponds of northwest Ohio.

Most of the lakes were first comprehensively sampled by ODNR/DNAP's Dan Rice and associates in the mid 1980's. The decline in species presence in the glacial lakes is due in part to siltation promoted by removal of bank riparian trees and shrubs, also from competition from introduced fish species, and perturbations by introduced common carp that root up the bottom of the lakes.

Next the crew began working on the Muskingum River where they employed the bottom trawl technique that was developed to sample areas of streams that are not reachable by more conventional means (seining and electrofishing), that cannot touch the bottoms of deeper areas of rivers. This method has been used to investigate abundance of species populations that in some cases were previously listed at some level of imperilment, but were found to be abundant enough even to be delisted.

Brian and Justin's next major foray will be trawling on the Ohio River – Tim Daniels, ODNR Reporter and Photographer, will accompany Brian and Justin this summer to document their ODNR/DOW sponsored stream trawling work. Look forward to a link to the ODNR production in an upcoming newsletter. (*M. Kibbey*)♣

Triplehorn Insect Collection. Norman Johnson and Luciana Musetti traveled to Ottawa (9-13 July) for their yearly visit to the Canadian National Insect Collection. Our mission was the return of loaned specimens, which included the holotypes of newly described species. In total, 992 specimens were returned, 11 of which were holotypes and 232 were paratypes of new species described recently within the *Platygastridea* PBI Project. In contrast to the winter visits, this time the weather was exceptionally beautiful, even though the locals were bemoaning the lack of any recent rain. In addition to meeting with Lubo Masner and discussing ongoing and planned projects, we had a chance to chat with other colleagues there including Gary Gibson, Pat Bouchard, Henri Goulet and John Huber. The Hymenoptera section there is due for a significant change this autumn. They will have a compactor system installed which will significantly increase the amount of effective storage space. This will require a 4-month shutdown in most operations and a diaspora of the people to temporary quarters throughout the Neatby Building during the processes of demolition and (re)construction. (*N. Johnson*)♣

Beetle Curation Project

Luciana Musetti, Curator, Triplehorn Insect Collection

The **Triplehorn Insect Collection** is one of the largest university collections in the USA. It grew from the research collections of the OSU's faculty, curators and students, dating back to the 1880's (yes, that old!). Over the years the collection has accumulated close to 4 million specimens and each year thousands more are added. Our specimens are used for research in taxonomic, systematics and ecological studies by scientists from the US and around the world.

A recent *Facilities Improvement Grant* from the National Science Foundation (NSF) to the Triplehorn collection has allowed for the installation of a compactor system and the acquisition of new cabinets, drawers and supplies. It resulted in a 66% increase in much needed storage capacity with the added bonus of a 30% footprint reduction. With more space and resources available, we could finally tackle the much needed upgrade of specimen storage units.

The beetles (Coleoptera) are one of the Triplehorn collection's most extensive, well-studied and heavily used groups of insects. This is due, in great part, to the collecting efforts and the scientific studies done by Charles Triplehorn, and by the collection's founder and first curator, Josef Knull. Their size and importance makes them a top curatorial priority.

Because of the age of the collection, and the way it initially grew, we have two significant curatorial problems: hard-bottom specimen unit trays and old insect drawers. The most difficult to address is the unit trays. A specimen holding tray or simply *unit tray*, is the basic storage unit in the collection – it holds and protects the pinned specimens. Our old unit trays have very hard cork bottoms, and the specimen pins are solidly lodged into them. To add insult to injury, due to lack of storage space early on in our history, most of the old unit trays are tightly packed with specimens. Handling these specimens is always a very damage-prone operation. These hard-bottom unit trays need to be replaced. Finally, our insect drawers (in which the unit trays are kept) are 80 years old, with loose lids that do not seal properly anymore, and they too need to be replaced.



Replacing the old unit trays is by far the most challenging of the tasks in this curatorial project. It involves gently, but firmly, extracting each of the specimens from the old unit trays and transferring them to new ones. The process requires skill, experience, but most of all, discipline to overcome the sometimes overwhelming urge to simply yank the specimens out of the old unit trays (a big no-no!). But brute force, though tempting, can only bring specimen destruction, with insect body parts flying across the work bench, even across the room – a complete curator's nightmare! So we control our frustration and move deliberately.



When the specimens are stuck, we use insect pliers (much like dentist's pliers) to break the grip of the cork bottom on the pin.

Triplehorn Insect Collection is being masterfully executed by our careful, well-trained, and very much trusted student assistants, in particular Josh Grant and Emily McDermott, with day-to-day oversight of our most skilled, ever-calm and positively competent Curatorial Technician, Sara Hemly.

Once released, the specimens are placed in new, foam-bottom unit trays. The foam bottom works much like a bug "pin cushion", holding and allowing for easy handling of the specimens in and out of the tray. The specimens in their new unit trays are then stored into new, tightly-sealed wooden insect drawers. For maximum accuracy and organization, we carefully label the unit trays according to the most updated taxonomic information and use color to indicate biogeographic realm.

To fulfill our commitment of making specimen level information freely available online, we then barcode each specimen and perform specimen-level data capture. Right now we are curating the ground beetles (family Carabidae) and there's a lot still to go. The specimen information, as it becomes available, can be found at <http://hol.osu.edu>.

The bulk of this unnervingly tedious, extremely delicate, outrageously detailed, and dramatically important piece of curatorial history at the

CSI MBD: Part II – The Case of the Hawaiian Tree Snails

G. Thomas Watters, Curator, Division of Molluscs

While unpacking some very old boxes I came across a treasure trove of Hawaiian tree snails. These snails belong to two families, Achatinellidae and Amastridae, largely endemic to the Hawaiian islands. Prior to European settlement every valley and ridge in the islands had its own unique blend of species. Adapted to living in bushes and trees, the intervening rocks and fields were a hostile environment leading to high endemism and isolation. Over time each mountain range, often each valley, evolved its own species. Predators were few. Life was good. Then came the Europeans. The snails quickly fell prey to the pigs and rats introduced by the invaders. Some species became extinct and even an entire genus, *Carelia* – containing some of the more impressive land snails in the world – is now extinct. Today most species are rare and protected.



Left-right, top-bottom: *Carelia cumingiana meneckeii* Cooke, 1931 (Kauai), entire genus extinct; *Achatinella abbreviata* Reeve, 1850 (Oahu); *Achatinella apexfulva simulans* Reeve, 1850 (Oahu); *Achatinella mustelina collaris* Welch, 1938 (Oahu); *Achatinella fulgens fulgens* Newcomb, 1854 (Oahu); *Achatinella mustelina christophersoni* Welch, 1942 (Oahu); *Partulina mighelsiana mighelsiana* (Pfeiffer, 1848) (Molokai); *Partulina splendida* (Newcomb, 1853) (Maui).

Beyond the sheer number of specimens in the boxes it was apparent that the shells were quite old. Old faded labels in a curious handwriting accompanied most of the shells. And a letter! The letter details the contents of a package containing numerous specimens, most with a few comments concerning their rarity. The letter was addressed to Henry Moores (1812-1896), an early Ohio natural history collector, whose massive collection of shells was purchased by OSU about 1890 for the then hefty sum of \$1,750. But who wrote the letter and sent the specimens?

The box also contained a note. Written around 1965 by William Clench, one of the demi-gods of malacology then at MCZ, the note suggested that the handwriting might be that of Wesley Newcomb. (Clench had been shown the specimens by then curator Carol Stein but the box was shelved.) Wesley Newcomb (1808-1892) was a physician, social activist, and malacologist. Born in New York, he moved from Albany to California in 1849, then to Hawaii in 1850 due, in part, to his wife's ill health. There he practiced medicine, served on the Board of Health, became active in the Hawaiian Temperance Movement, and collected a lot of shells. In 1855 he returned to Albany. His collection was purchased by Ezra Cornell, founder of Cornell University, for \$15,000, and it resides there still. An avid shell collector, Newcomb traveled to Europe, the West Indies, and Central and South America as well as Hawaii. He described over 100 species, including many Hawaiian Achatinellidae and Amastridae. We asked the curator of Cornell's Paleontological Research Institute for some samples of Wesley's handwriting. To our amazement (and joy!) the handwriting matches and the specimens were indeed Newcomb's, which he had either sold or traded to Moores in the 1850s, probably when he returned to Albany. The letter had arrived before the shells as Newcomb tells Moores to "Wait for the Waggon! (Express)." One label bears the opinionated observation: "'guernea' W.H.P. [crossed out, then added:] *A. perversa*? Swains. '*guernea*' of some fool." Newcomb's "fool" was apparently contemporary fellow Hawaiian malacologist, William Harper Pease, whom he apparently did not hold in high regard.

So, through a little detective work, we now know that we have a portion of one of the largest and oldest collections of these rare snails in the world. They are priceless specimens that Newcomb collected and used to describe his species. Many, probably most, can never be collected again. We welcome anyone who would like to see more of these beautiful specimens. ♣



Next issue of the MBDNewsletter coming up Fall 2012



We want to hear from our readers!

Please send feedback to the Editor (osuc-curator@osu.edu).



ABOUT US

The **Museum of Biological Diversity** (MBD) is a research facility in the *Department of Evolution, Ecology and Organismal Biology, College Arts & Sciences, The Ohio State University*. The Museum houses all of the OSU's biological collections, except fossils. The main focus of the collections is the discovery, documentation and interpretation of biodiversity. The collections are an irreplaceable repository of specimens and information on the biodiversity of Ohio, the USA and the world. We provide extensive information about our holdings to the scientific community and to the general public through publications, websites and online databases.

The Museum is not regularly open to the public. Once a year, during our Annual Open House, we invite the community to tour our facilities and to interact with the faculty, staff and students. We host visits from classes taught at OSU and the individual units also welcome local school and community groups for guided tours by appointment. Links to the collections websites are available on the Museum website at mbd.osu.edu.

Museum Address: 1315 Kinnear Road, Columbus, OH 43212-1157.

The **MBDNewsletter** is a quarterly publication featuring news and information on the collections at the **Museum of Biological Diversity**. The newsletter is produced by the Curators of the collections, with contributions from faculty, staff, students and associates of the collections. The **MBDNewsletter** is available **online** at mbd.osu.edu/newsletter.