The Ohio State University

Museum of Biological Diversity

Newsletter

Fall Semester 2013

College of Arts and Sciences. Department of Evolution, Ecology and Organismal Biology

Dear Readers:

Welcome to another action-packed issue of the MBD Newsletter! We hope you enjoy it!

In this issue:

❖ Page 1 →

- "Museum Open House 2014 – the big picture."
- "Technology and Biodiversity.", *by Norman Johnson*

❖ Page 2 →

- "The Herbarium Technology Toolbox.", *by Cynthia Dassler*
- "Sneak peek on how technology moves research in our collections.", *by Angelika Nelson*

❖ Page 3 →

- "Tools to collect and study molluscs.", *by G. Tom Watters*
- News & Updates

❖ Page 7 →

- "On the trail of a mystery mollusc in Antigua" *by G. Tom Watters*.

❖ Page 8 →

- "What has this common backyard plant got to do with "Velcro"? *by Mesfin Tadesse*
- Recent Publications
- Recent Presentations
- Fellowships & Current Grants

❖ Page 9 →

- "Ohio's Natural History: Dig it - Yet Again!" *by Bob Glotzhober*
- *"Impressions on returning to the Museum of Biological Diversity" by Tod Stuessy*

❖ Page 11 →

- List of contributors

❖ Page 12 →

- A gift for biodiversity

The **MBDNewsletter** is a 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.odu.edu/newsletter***.

Cover – Emily Riggins, Ohio Historical Society intern, cataloging broken vertebra from Orleton mastodon, *photo © Bob Glotzhober.*

Museum of Biological Diversity
Discovery · Documentation · Interpretation · Education
Newsletter
Editor: L. Musetti

Museum Open House 2014 – the big picture.

It's late Fall in central Ohio. The scientists and volunteers in the Museum of Biological Diversity are already gettting ready for next year's Open House. This will be a very special event for us: our 10th anniversary. The popularity of the event has grown tremendously since we started back in 2005. From just a few hundred visitors in the first year to almost 1,300 in 2013!

Visitors coming into the building for the first time will sometimes ask: *"A Museum with no displays?! What's the point of that?"*, or *"What do you mean by "research collections?"* and, most importantly, *"Why should I care?"* Fair questions to ask. And we do have many answers. Of course we could write them down, and in fact we do. But there are very few things that scientists like more than a good old '**show** & **tell**'. The Museum Open House is a great way for us to do just that: to show people *what* we do & to tell them *why* we do it; to share with visitors of all ages our *passion* for the natural world & our *dedication* to learning about it; and to demonstrate why we all, scientists or not, should care about biological collections & for science.

In this issue of the newsletter we talk about the concept behind the upcoming Open House and the approach of each individual collection towards the main idea. **Mark your calendars and join us: *MBD Open House* - Saturday, February 8, 2014.**☘

The Tech of Biodiversity Studies.

by Norman Johnson

There are more than 9 million specimens in the collections of the Museum of Biological Diversity. These not only serve to document the richness of our flora and fauna, but are research material to better understand the diversity of life. In our research we ask questions of these specimens, but they rarely respond directly. We need tools in order to get our answers. This intersection between our specimens and technology will be theme of this years annual Open House, **the natural history toolbox: where tech meets biodiversity.**

The author, setting up yellow pan traps near a creek.

In the mid 1990's I had the opportunity to join up with colleagues from Brazil and Brigham Young University in a biodiversity survey of an area destined to be flooded by the reservoir created by a new hydroelectric dam. It was a real learning experience, rubbing shoulders with faculty and students collecting fish, lizards, snakes, birds, and mammals (sorry, no plants on that trip!). While I was on my hands and knees setting small bowls out as insect traps, the herpetologists were burying 2-gallon buckets for lizards to stumble into, the bat guys were spreading mist nets across the streams, and the bird collectors were peering up in the trees to try to spot the squawking parrots. Once they'd gotten their specimens, the techniques for processing them were equally fascinating. There we were, out in the middle of the Brazilian savanna, roughing it by sleeping in tents and drinking filtered water from the local stream, but also carrying along containers of liquid nitrogen for tissue preservation for DNA study and some of the most extravagant -- and probably expensive -- camera equipment I'd ever seen. I like to think that the focus of the insect collectors on the minutia of the habitat gave the others a different perspective as well.

Back here in Columbus, I could spend hours, maybe even days, just browsing through the drawers and cabinets of the insect collection marveling at all of the shapes, colors, extravagances, and the sheer variety offered in the entomological world.

One of the great pleasures of the annual Open House is the chance to share that with others, to see their eyebrows go up and their jaws drop when they encounter some of these beauties for the first time. But wait, there's more (apologies to Ron Popeil): these specimens didn't just materialize out of thin air. The back story of the ingenuity and field savvy of the collectors, the tools they use to collect the specimens, and the amazing lengths to which they go in order to wrest information out of the natural world adds a new dimension to the specimens that is just as interesting.

It is those extra dimensions, specifically the tools we use to study biodiversity, that we plan to highlight in this year's Open House. Collecting gear, imaging systems, recording gear, and equipment to extract and amplify DNA will all be on display along with the researchers that work with them. Please plan to visit us on **Saturday, February 8**: bring the kids, the grandparents, even the neighbors. It'll probably be cold outside, but we guarantee a warm welcome.☘

The Herbarium Technology Toolbox.

by Cynthia Dassler

Technology used at the Ohio State University Herbarium ranges from uncomplicated tools used for observations of the natural world to elaborate innovations employed to integrate disciplines, such as, ecology, physiology and molecular heredity. The basic knowledge of plants starts with observations and collections of plants in their natural habitat. The hand lens that a botanist traditionally carries around her/his neck and the plant press are the staples of field exploration. Pressed or preserved plants are brought from the field to the lab, where the features of the plants are examined using microscopes that can magnify structures from 2 to 400 times. These observations lead to classification of plants into species, genera and families, and to hypotheses of their evolutionary connections, *i.e.*, their phylogenetic relationships. Hypotheses about phylogenetic relationships of plants are continuously refined as advances in technology enable us to use molecular characters from DNA sequences.

Microscopes are used to observe small features.

The Herbarium stores and preserves plant specimens that hold the key to knowledge about issues, such as, past plants growing in a region, timing of developmental processes within a species, and variation of characters upon which plant classifications and phylogenetic relationships are based. Databasing and imaging technology are used to facilitate worldwide communication of the knowledge encompassed within the plants in the Herbarium. Each specimen can be photographed and associated with its identification and location information, which grants researchers the ability to synthesize data from many herbaria without the loan of physical specimens.

Plants are pressed between layers of cardboard, blotters and newspaper until dry.

The Herbarium holds a gold mine of information about plants that researchers use when teaching about plants. Students in classes at The Ohio State University, such as Ohio Plants and Plant Taxonomy, as well as graduate students, utilize plant specimens in the Herbarium and tools from the Herbarium's technological toolbox. Students examine and press plants in the field, observe plant characters in the lab with microscopes, utilize the Herbarium database, and sequence plant DNA. Occasionally, teaching brings technology to the Herbarium. Students in Ohio Flora are supplementing the Herbarium toolbox by using iPads to document, collect and analyze data about plants in the field. Mobile technology may be the next new tool incorporated into the Herbarium's technological toolbox. During the 2014 MBD Open House, the Herbarium will showcase tools from its technological toolbox with the hope of sharing some of the excitement found when observing and researching plants.☘

Sneak peek on how technology moves research in our collections.

by Angelika Nelson

Amplicorp VU Magnemite 610 DV portable hand crank reel to reel tape recorder.

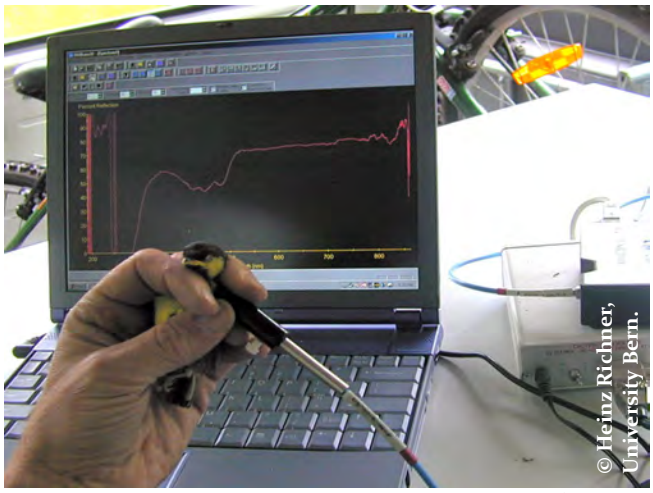
At the Borror Laboratory of Bioacoustics: Humans enjoy listening to music and bird song, but how many of us can actually describe the heard sounds in detail when asked these questions: How many notes are there? What is the pitch of these notes? How long are the songs? For objective description and analyzes we rely on some instrumentation that captures acoustic signals and then displays sound.

The sound recording equipment that researchers use in the field to record animal vocalizations has undergone tremendous changes over the last century. The first portable recording equipment, a magnetic tape recorder, to take outdoors and record vocalizing animals in their natural environment became available after the Second World War. The very first recording of an animal's sound, actually a pet Indian Shama bird, was done even earlier on an Edison phonograph and a box of wax cylinders by the German Ludwig Koch in 1889. The recording can still be listened to at the *British Library*.

Over time recording equipment has not only become smaller, lighter, and more portable but also most importantly changed from analog to digital.

The **Borror Laboratory of Bioacoustics** will trace the history of this development, showcase some of its old, historic recorders and a similar development among microphones.

At the Tetrapod Collection: Spectrophotometers (*right*) have revolutionized our view of color perception in the avian world. Birds are incredibly visual animals. Their high visual acuity is not only necessary to find and acquire food, but also to navigate surroundings, to identify conspecifics and potential mates, and to quickly identify and escape from predators. It is thus not surprising that they have excellent vision and their perception of color even extends into the ultraviolet range (below 400 nm) of the light spectrum which we humans cannot perceive.



Measuring plumage color reflectance of a bird's feathers using a spectrophotometer.

This discovery leaves us with the problem of finding a way to quantify coloration in the same way that birds do to be able to draw meaningful conclusions on the function of color in a bird's environment. The tool we use is the spectrophotometer. This instrument measures color components objectively across the entire range of wavelengths in white light, something human eyes cannot do.

Jen Foren, an OSU undergraduate student, designed a project to measure coloration of bird egg shells with a spectrophotometer (she reported in detail in the past issue). She is intrigued by the variation of egg colors and patterns that she observes among different bird species and hypothesized that egg colors and patterns vary with the bird's nesting habits. Some birds build their nests in the open with the eggs clearly visible, whereas other birds lay their eggs inside tree stumps or man-made nestboxes, well hidden from the outside world. The light environments differ drastically among nesting sites and camouflage of the eggs may be vital. Jen did her research in collaboration with Dr. Jackie Augustine at the OSU Lima regional campus. Dr. Augustine also uses a spectrophotometer to evaluate plumage coloration in Greater Prairie-Chickens. One of her students, Erin Linderman, will demonstrate her work during the Open House.☘

Tools to collect and study molluscs.

by G. Tom Watters

Passive Integrated Transponders, glued to the shell of rare mussel specimens, help scientists to track them in the field over the years.

Collecting molluscs can be an adventure, whether avoiding unfriendly sharks while collecting in the ocean or avoiding unfriendly humans while collecting in the mountains of Jamaica. Our collections are primarily terrestrial and freshwater and each obviously requires specialized collecting and monitoring equipment. Because perhaps 75% of all land snails are <10 mm in size as adults, the most efficient method of enumerating their diversity is through leaf litter samples. These samples are dried and then laboriously sorted under a microscope for the tiny snails. Freshwater molluscs are a special problem.

Unlike fishes, they cannot be sampled by nets or electroshocking. You need to get on the bottom to find them. To this end we use under-water viewers, snorkels, and SCUBA equipment. To monitor rare individuals we tag them with Passive Integrated Transponders (*above*), which allow us to track them in the field, year after year. To photograph our findings we use sophisticated computer-assisted cameras, remote-controlled rails, and image stacking software.☘

News & Updates

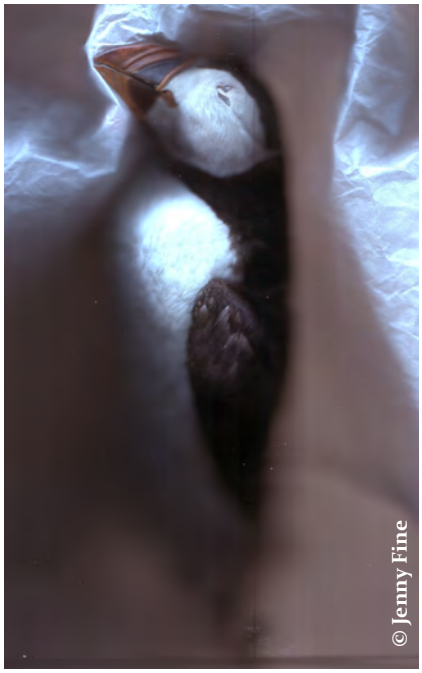
▪ ***Acarology.*** **New people –** For Fall semester 2013 the Acarology Laboratory is joined by Orlando Combita. Orlando has been working on mites for quite some time in his native Colombia. He most recently worked on water mites, but is now thinking about working on tortoise mites (Uropodina) for his Ph.D.

Travel – As a follow-up to a previous visit to the OSU Acarology Lab last year by a Brazilian student, Grazielle Furtado Moreira, I traveled to Piracicaba and Jaboticabal, São Paulo, Brazil in October. Mostly working on various publications, presenting 2 seminars, and talking to a lot of folks. Fantastic to see so many very enthusiastic students working on mites. Overall quite

productive. I did tour around a little, learning about the very hot weather in Jaboticabal, soccer (principally the team called Palmeiras), and the many virtues of the state of Minas Gerais. Never thought of capybara (very oversized rodents) as pest species, but I can see the point. Very good for producing ticks though, so there is a use for them. (*H. Klompen*)☘

▪ ***Borror Laboratory of Bioacoustics (BLB) & Tetrapod Division*.** **New people –** A big welcome to Erin Linderman who joined the Borror lab as a graduate student in August. Erin will be supervised jointly by Dr. Jackie Augustine and Dr. Doug Nelson.

Loans & Visitors – Jenny Fine, studio assistant in *Ann Hamilton's Studio*, visited the bird collection and took detailed images of many specimens. The imaging method was rather unusual for museum specimens: each of the birds was placed on a flatbed scanner and an image scanned. The effect of light and darkness added to the artistic content of the images. See for yourself on this image of the Atlantic Puffin (*right*)!



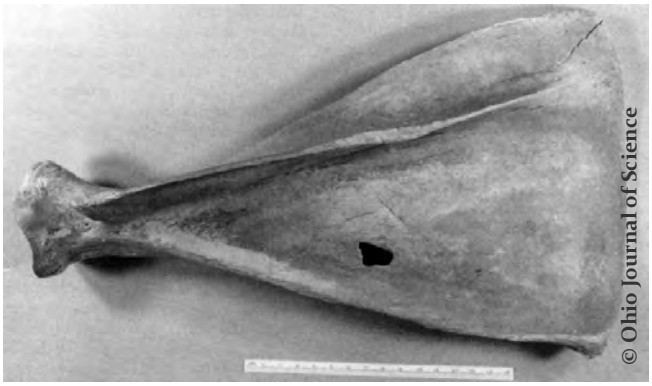
Flatbed scan of an Atlantic Puffin specimen in the bird collection.

Carmel Buckley, associate professor in the Department of Art, teaches in the sculpture and foundation programs and arranged a visit of students in her art class to the bird collection. Some of the students borrowed bird specimens to study further for their projects.

Dr. Michael Murphy, Associate Professor in the Department of Biology at Portland State University, requested measurements of eggs from birds in the flycatcher family. The OSU bird collection holds 43 clutches from species in that family, each with 2-5 eggs. Undergraduate research assistant Stephanie Malinich undertook the task of measuring length and width of these fragile museum specimens and reports: "Eggs are one of the most fragile but important collections a museum can have due to the vast information an egg can hold about a particular species. Last month, I had the opportunity to work with the bird egg collection by measuring eggs for Dr. Michael Murphy. Dr. Murphy was looking at eggs from the genus *Tyrannus,* a group of large insect-eating birds in the tyrant flycatcher family, and he asked for information about clutch size, egg width and length and location where the eggs were found. My work was primarily to measure the egg length and width with a caliper *(left)* and to avoid crushing the fragile pieces of information I held between my fingers. I measured 43 clutches and a total of 146 eggs. It was a unique opportunity that allowed me to learn much about bird eggs."

Calipers are used to measure length and width of an egg.

David Dyer, Natural History Curator at the Ohio Historical Society, expressed interest in the skeletal material of a prehistoric elk from Cranberry Prairie, Mercer County, Ohio in 1981 that has been housed at the tetrapod collection for several decades. Radiocarbon analysis of a bone sample date the elk skeleton to 9370 B.P. The skeleton is interesting because of some unusual features including extreme dental wear and a hole punched through one of the shoulder blades, probably due to a prehistoric hunting weapon (*right*). It was decided that the elk should be transferred to the Ohio Historical Society where it may go on display in the near future.



Elk left shoulder blade with hole.

Meetings – Several members of the Borror lab attended an ornithological meeting in Chicago in August. Stephanie (Wright) Nelson, PhD student in the Borror lab, reports: "The Field Museum hosted a joint meeting of the **American Ornithologists' Union** and **Cooper Ornithological Society** from 12-17 August in Chicago, IL. Researchers from the Borror Laboratory of Bioacoustics were in attendance in addition to members of Dr. Jackie Augustine's and Dr. Amanda Rodewald's research groups from Ohio State. Stephanie Wright, from the Borror Lab, presented a poster on her research on innate song learning in chickadees, you may have heard the subjects when you passed by room 1320 in the Museum of Biological Diversity in the past few years. In addition to her poster, Stephanie was a panelist for a workshop on using digital museum specimens in research and helped organize a silent auction that raised over $2,600 for student events at future AOU meetings. Dr. Augustine presented a talk on her and Kevin Oxenrider's work on quantifying male ornaments in prairie-chicken species using air sac reflectance. Kevin also presented a poster on habitat characteristics in hybridizing prairie-chicken leks and Jenny Hale gave a talk on her Master's work on prairie-chicken vocalizations. Nate Sackinger and Zee Khan, OSU undergraduates working with Dr. Augustine, presented posters on their research investigating seasonal changes in the vocalizations of and microhabitat effects on reproductive success in House Wrens."

The fall season of the **Columbus Audubon Society** monthly meetings at the Grange Insurance Audubon Center in downtown Columbus has started (see *upcoming events*). The kick-off was a presentation by Edward Burtt, Professor at Ohio Wesleyan University who talked about the Father of American Ornithology, Alexander Wilson. The event was timely as this year marked the 200th anniversary of Wilson's death and Dr. Burtt had published a book about Alexander Wilson and his achievements.

Alexander Wilson was a Scottish-American poet, ornithologist and naturalist. He was born in 1766 and emigrated to North America in 1794. Based on his observations of birds and travels in the Eastern USA he published an extensive nine-volume work in which he illustrated 268 species of birds and called it the *American Ornithology* (published in 1808–1814).

To honor Wilson's lifetime achievements for American ornithology several bird species were named after him, including the Wilson's Storm-Petrel, Wilson's Plover, Wilson's Phalarope, Wilson's Snipe, and Wilson's Warbler. The Ohio State bird collection has specimens of all these species and we displayed them during the meeting. The birds were set up as a quiz with closely-related species to the ones that were named after Wilson. One of the prizes was a copy of the book *Alexander Wilson*: *the Scot who founded American ornithology* by Edward H. Burtt, Jr., and William E. Davis, Jr.

Wilson's phalarope, one of the bird species named after Alexander Wilson.

The Borror lab sent CDs of our in-house production **"Amphibiance"**, a CD containing frog and toad solo and medleys, to the Carnegie Museum of Natural History. These CDs will be available for purchase through the Carnegie Museum's gift store. Find the track listing *here*. (*A. Nelson*)☘

▪ **Fish Division.** As in past months Brian Zimmerman and Justin Baker have been collecting fishes resulting in some remarkable finds being made this year in the state of Ohio. During December of 2011 the crew of two travelled to the northwest corner of the state, to the Auglaize River in Allen County, where we had old collection records (from the OSUM Fish Division's database) for the **Pirate perch**, *Aphredoderus sayanus*. After plotting the sites, much to our surprise they seined up one specimen of the species, very near a historical locality in the river. We were all quite excited, as it could have meant there had been a refuge population undiscovered since 1957, when longtime OSUM Fish Division Curator Milton Trautman last collected Pirate perch from the drainage. That record also represented the last time anyone had collected Pirate perch from the state, resulting in a State Endangered and possibly extirpated status.

Justin (*left*) and Brian (*right*) searching for Pirate perch at Camp Creek.

As it turned out, there were other factors involved in the discovery, unbeknownst to us and most of the rest of the Ichthyological community: a Pirate perch reintroduction had taken place during the year 1999. Upon announcing the rediscovery of the species to certain persons it was revealed that they had participated in a project to collect and propagate the Pirate perch for eventual reintroduction. The propagation efforts were going along quite successfully until the broodstock and brood contracted a parasite. The entire stock was infected and were disposed of, and the project was terminated.

However, a portion of the original stock was not needed for the project, and rather than return them to their home (which is not allowed; unused stock must be euthanized to prevent accidental disturbances of the native population such as infection, primarily) the additional stock was placed in the Auglaize River near the historical sites. Since the Pirate perch only live about 3-4 years, the recent discovery must almost certainly have resulted from recruitment of progeny from the reintroduction, such that the specimen caught in 2011 may have been a fourth generation progeny. Also, the likelihood that there had been a refuge population in Camp Creek or other Auglaize River tributaries is quite low given that Ohio agencies and individuals sampled several localities in the drainage in the years since Trautman collected the last known individual.

Next, in the summer of 2013, Brian and Justin invited me to accompany them to the region to help ascertain the extent of the little fishes' distribution in the Auglaize River watershed. What we found was astounding! The first spot we stopped at was a road crossing over Camp Creek, a small tributary near Lima, Ohio. Less than a minute after entering the creek we seined up dozens of Pirate perch, with specimens of every year class represented by individuals 30 to 120 millimeters in size. Stops at several other

localities in Camp Creek as well as in the Auglaize River mainstem resulted in more captures. It is apparent that Pirate perch are reestablished in the state of Ohio.

It remains to be seen how far they spread in the Maumee River drainage, or whether another unforeseen circumstance, such as an infection, wipes them out. Since it is likely the species was at one time much more widespread in the state previous to modification of Ohio's waters, it would be beneficial to introduce them to other waters as well. Predictive modeling utilizing historical records from museum databases, and matching similar habitats with GIS and other mapping technologies combined with statistical analysis are in use that evaluate an environ's suitability for species introductions. (*M. Kibbey*)☘

▪ ***Herbarium.*** The herbarium was visited by 35 people who were interested in learning and documenting plants collected by William S. Sullivant (from Riverglen Dr, Worthington, Ohio), specimens of Ophioglossaceae (the adder's tongue family, by members of Denison University), plant pathogens and the model plant, *Arabidopsis thaliana* (members of OSU-Horticulture & Crop Sciences Department). Members of the Ohio Moss and Lichen Association (OMLA) were frequent visitors of the Bryophyte and Lichen collections. Students of EEOB who took a course about Ohio Flora and staff of CTL Engineering spent time examining and touring the collections. (*M. Tadesse*)☘

▪ ***Molluscs.*** **New malacologist! –** In October Division Collections Manager **Clarissa Bey** gave birth to **Clayton Richard Bey**. Both mom and mini-malacologist are doing fine.

Workshop – In October the Division of Molluscs conducted a **Freshwater Mussel Identification Workshop**. The workshop was in response to new state and federal guidelines and protocols for working with freshwater mussels in Ohio. New regulations require that scientists and contractors be able to pass a mandatory, rigorous identification test before being issued a collecting permit. The Division developed and will administer and grade the tests. Forty people from several states attended the workshop.

Also in October the Division of Molluscs hosted the **7th meeting of OVUM – Ohio Valley Unified Malacologists**. This one-day meeting is free and open to professionals, amateurs and students who are interested in any aspect of molluscan biology. OVUM has no dues, officers, abstract requirements, or publications. The meeting is patterned after similar informal symposia held around the country. The meeting drew 20 participants from as far away as Philadelphia and Delaware. Topics of the fifteen talks ranged from "Fossil land snails of the Canary Islands" to "The type digitization project at the Academy of Natural Sciences." Three EEOB graduate students participated: Amy Barrett, Nick Skomrock and Ieva Roznere. Next year's meeting will be hosted by the University of Cincinnati. (T. *Watters*)☘

▪ ***Triplehorn Insect Collection. New people*** **–** We welcome **Elizabeth Alvarez** back to the collection. Liz worked here as an undergraduate assistant for 3 years. After graduating with an Art Technology Major from Ohio State, she spent the summer working at the USDA Parasitic Hymenoptera lab in Washington DC. In September she re-joined the Triplehorn collection, now as a Research Aide. She is currently working on imaging insect specimens and training undergraduate students on imaging techniques as well. We also welcome **Josh Gibson** and **Riley Gott,** both Entomology majors, who joined us in September as Undergraduate Curatorial Assistants.

Visitors – We had several interesting visits and tours this semester. One of the highlights was *Dani Leventhal's* "**Life Studio Drawing I**" class (Department of Art at Ohio State), on 23 September. The morning started with their regular art class in the Museum auditorium. The topic was the work of *M.J. Bole*, renowned artist and former Ohio state faculty. As a special treat, Ms. Bole was present at the class and discussed her work with the students. After the class the students examined several displays of large and colorful insects, such as giant grasshoppers and Hercules beetles. As part of their class assignment, Dani instructed them to produced sketches of the dry insect specimens. Photos of the event, including images of the great sketches that were being produced by the students, are available in the collection's Facebook page under *Art meets Science*. Some of the resulting artwork produced by the students will be exhibited during the Museum Open House 2014.

Members of Chrysalis visiting the collection.

Members of **Chrysalis** (*left*), Ohio State's *Undergraduate Entomology Club*, stopped by for a tour of the collection on 27 September. We talked and had a fun time looking at beautiful insects. More photos of the visit are available at the collection's Facebook page under *Chrysalis visit 2013*.

We also had a number of research visitors. **Dr. Aaron Smith** (10-11 September), a Post-doctoral Research Associate at the American Museum of Natural History (AMNH) and the International Institute for Species Exploration (IISE), Arizona State University, came to work with Dr. Chuck Triplehorn on collaborative projects focused on Tenebrionidae beetles, to image holotypes of the genus *Eleodes* and to borrow more specimens for his research.

Dr. Robert Barney, from West Virginian State University (26 September) visited for an afternoon of work in the collection, to return loaned material and to borrow more beetle specimens of the genus *Pachybrachis* (Chrysomelidae) for study.

Donations and Voucher Depositions – Voucher specimens are exemplars of the species examined in a biological study. They are an important part of any taxonomic, ecological or experimental work in Entomology. Vouchers should always be deposited in a *publicly available research collection*, such as the Triplehorn Collection, for future reference. We have received several voucher specimen depositions in the past few months. Among the highlights are: **a)** the holotype and two paratypes of Nycterophilia bilineata, a newly described species of 'bat fly' (Diptera: Streblidae) – ectoparisites of bats; and **b)** 723 specimens in 39 species of ground beetles (Carabidae) from Ohio. These are vouchers of Kayla Perry's Masters research project. Kayla is an Ohio State Entomology graduate student in Dr. Dan Herms' Lab at Wooster. More images available *here*.

Curation – 34,031 specimens in 1,525 taxa have been transferred to new, properly labeled trays and drawers. Of those, 18,593 specimens (55% of total) have been barcoded and databased. We expect to conclude the data entry of the Carabidae by April 2014. As we database the specimens, the information is immediately available online.(*L. Musetti*)♣

Snapshot of ground beetle specimens recently deposited at the Triplehorn Insect Collection as research vouchers.

On the trail of a mystery mollusc in Antigua

by G. Tom Watters

Ever since the publication of "Antiguan Shallow-water Seashells" by Deng Yan Zhang in 2011, malacologists have wondered about an unidentified species of wing oyster reported from the island in that book. Known from only isolated areas of two bays, it was clearly not related to anything else in the western Atlantic Ocean, but seemed closest to Indo-Pacific species in the genus *Electroma.* **New species? Recent introduction?**

Colleague and ex-Ohioan Francisco Borrero, now at the Academy of Natural Sciences, was working on the problem but needed preserved material for DNA studies to solve the puzzle. As luck would have it, in September I was going to Antigua to track down an endemic land snail (which I found). With author Zhang as a guide, we decided to try and locate the mystery mollusc and preserve some specimens. The first known location was a bust, the population appearing to have been eliminated by pollution from a nearby factory. But on the last day we succeeded in finding the species in a very small patch attached to shoal grass in the middle of Valley Church Bay (*left*) on the west coast of the island. Preserved specimens have been handed off to Francisco for analysis and we await results.

Electroma sp. attached to shoal grass;~10mm in length.

Valley Church Bay – I've collected in worse places.

What has this common backyard plant got to do with "Velcro"?

by Mesfin Tadesse

The idea to develop "Velcro" came from an observation made on the fur of the dog of a Swiss engineer in 1945. The engineer noticed the fruiting heads of a plant known as burdock which is quite a common weed here in Columbus, Ohio. Its' scientific name is ***Arctium lappa*** (*right*). When seeing that the fruiting heads were firmly attached to the fur of his dog in 1945, the Swiss engineer, George de Mestral decided to examine them under the microscope. He noticed that the fruits were covered with numerous hooked bristles. Soon he thought of applying this observation to good use and was able to manufacture the first hook-and-loop fastener. Velcro is today a company which produces hook-and-loop fasteners that have served as replacements for zippers, shoe laces, chess boards for astronauts, etc., among other uses.

Burdock, *Arctium lappa,* inspired the development of hook-and-loop fasteners, commonly known as velcro.

Recent Publications

Aguiar, A.P., A.R. Deans, M.S. Engel, M. Forshage, J.T. Huber, J.T. Jennings, **N.F. Johnson**, A.S. Lelej, J.T. Longino, V. Lohrmann, I. Mikó, M. Ohl, C. Rasmussen, A. Taeger & D.S.K. Yu. 2013. Order Hymenoptera. Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. **Zootaxa** 3703: 51-62.

Burks, R.A., L. Masner, **N.F. Johnson** & A.D. Austin. 2013. Systematics of the parasitic wasp genus *Oxyscelio* Kieffer (Hymenoptera, Platygastridae s.l.), part II: the Australian and southwest Pacific fauna. **ZooKeys** 331: 1-266. *doi: 10.3897/zookeys.331.5152*

Johnson, N.F., R. Burks, A. Austin & Z.-F. Xu. 2013. Chinese species of egg-parasitoids of the genera *Oxyscelio* Kieffer, Hepatscelio Kieffer and *Platyscelio* Kieffer (Hymenoptera: Platygastridae s.l., Scelioninae). **Biodiversity Data Journal** 1: e987. *doi: 10.3897/BDJ.1.e987*

Nelson, D.A. and **A. Poesel**. 2013. Song sharing correlates with lifetime social pairing success but not territory tenure in the Puget Sound white-crowned sparrow. **Behavioral Ecology and Sociobiology** 67: 993-1000.

Mesfin Tadesse & D.J. Crawford. 2013. The phytomelanin layer in traditional members of *Bidens* and *Coreopsis* and phylogeny of the Coreopsideae (Compositae). **Nordic Journal of Botany**. First published online: 14 OCT 2013. *doi: 10.1111/j.1756-1051.2011.001714.x*

Taekul, C., A.A. Valerio, A.D. Austin, **H. Klompen** & **N.F. Johnson**. 2013. Molecular phylogeny of telenomine egg parasitoids (Hymenoptera: Platygastridae s.l.: Telenominae): evolution of host shifts and implications for classification. **Systematic Entomology.** First published online: 1 SEP 2013. *doi:10.1111/syen.12032*

Talamas, E.J., L. Masner & **N.F. Johnson**. Systematics of *Trichoteleia* Kieffer and *Paridris* Kieffer (Hymenoptera: Platygastroidea, Platygastridae). **Journal of Hymenoptera Research** 34:1-79 doi: 10.3897/JHR.34.4714

Recent Presentations

Augustine, J.K. & K.J. Oxenrider. "Can air sac reflectance be used to determine species identity and individual quality in prairie-chickens (*Tympanuchus* spp.)?" **Oral Presentation.** American Ornithologists' Union & Cooper Ornithological Society, Chicago, IL. 12-17 August.

Hale, J.A., **D.A. Nelson**, & **J.K. Augustine**. The role of male vocal signals during male-male competition and female mate choice in Greater Prairie-Chickens. **Oral Presentation.** American Ornithologists' Union & Cooper Ornithological Society, Chicago, IL. 15 August.

Johnson, N.F. & **L. Musetti**. "World genera of aquatic Platygastridae (Hymenoptera: Platygastroidea)." **Poster Presentation**. Annual Meeting of the Entomological Society of America, Austin, TX. 13 November, 2013.

Khan, Z. & **J.K. Augustine**. "Effect of microhabitat on the reproductive success of House Wrens." **Oral Presentation.** American Ornithologists' Union & Cooper Ornithological Society, Chicago, IL. 12-17 August.

Oxenrider, K.J. & **J.K. Augustine**. "Habitat characteristics of Greater and Lesser Prairie-Chicken leks in a recently developed hybrid habitat." **Oral Presentation.** American Ornithologists' Union and Cooper Ornithological Society, Chicago, IL. 12-17 August.

Sackinger, N.J. & **J.K. Augustine**. "Do male House Wrens vary their singing among various reproductive stages?" **Oral Presentation.** American Ornithologists' Union & Cooper Ornithological Society, Chicago, IL. 12-17 August.

Valerio, A.A., **L. Musetti** & **N.F. Johnson.** "Species of the colorful genus *Chromoteleia* Ashmead (Hymenoptera: Platygastroidea, Platygastridae s.l.)" **Poster Presentation.** Annual Meeting of the Entomological Society of America, Austin, TX. 13 November, 2013.

Watters, G.T. Reintroducing the federally endangered Northern Riffleshell to Ohio; or, the bitch is back. **Oral Presentation.** Conchologists of America Annual Meeting, Sarasota, FL. July.

Wright, S., **D. A. Nelson**, and R. L. Curry. "Innate preferences for conspecific song in two closely related chickadee species: potential consequences for hybridization." **Oral presentation.** Joint meeting of American Ornithologists' Union and Cooper Ornithological Society, Chicago, IL. 15 August, 2013.

Fellowships & Current Grants

Beati, L., **H. Klompen**, L. Durden & **N.F. 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, current record of freshwater fish distributions in Ohio, which will be used to help direct future research and management efforts. ***$153, 100***. 2013-2014.

Freudenstein, J.V. "Systematics of Monotropoideae and Pyroloideae (Ericaceae)." National Science Foundation, 2009-2013.

Freudenstein, J.V & **M. Tadesse**. "Databasing of the Ohio Flora at The Ohio State University", National Science Foundation, 2009-2013.

Molluscs Division. Aquatic Mollusks Inventory and Distribution, ODNR ODW, ***$47,517***. 2012-2013.

Molluscs Division. Freshwater Mussel Health Assessment, ODNR ODW, ***$32,087***, 2012-2013.

Molluscs Division. Aquatic Mollusks Conservation, Research & Surveys, ODNR ODW, ***$61,838***, 2012-2013.

Nelson, D.A., **A. Poesel**, H.L. Gibbs, J.W. Olesik. "Digitization of recorded sounds in the Florida Museum of Natural History". National Science Foundation, DBI-0846354, REU Supplement. ***$5,998***. 2010 - 2012 (extended through December 2013).

Nelson, D.A., **A. Poesel**, D.W. Steadman, T.W. Webber. "Digitization of recorded sounds in the Florida Museum of Natural History." National Science Foundation, DBI-0846354. ***$466,581***. 2009 - 2012 (extended through December 2013).

OSU Herbarium. "National Science Foundation, "Digitization TCN Collaborative Research: North American Lichens and Bryophytes: Sensitive Indicators of Environmental Quality and Change". Collaborative with multiple PIs. Total funding: ***$4,198,841***. 2011-2015

Ohio's Natural History: Dig it - Yet Again!

by Bob Glotzhober

Phase 1 – 1949. In November of 1949, workmen at the Orleton Farms in Madison County discovered a skeleton of a mastodon when repairing a drain tile. Finding a mastodon is always exciting, even though they have been excavated in two-thirds of Ohio counties – probably representing over 200 finds. They are exciting because mastodons are extinct, and their bones are huge! Of course, some of those finds are only a few bones, and some are a single tooth. The Orleton mastodon, however, was an extensive find with many, many bones.

Dale Gnidovec, Curator of the Orton Geological Museum at Ohio State.

The find was reported to the staff at the Ohio Historical Society (OHS), and the bones were recovered by a team including Ray Baby, Robert Goslin, Ed Thomas and others. The experts interpreted and described the bones, and published the final result in the January 1952 issue of the Ohio Journal of Science. In total, 28 pages of professional journal articles explored the aspects of this find, including the geological setting, the pollen mix, some snails and other mollusks buried at the same time, and tooth chew marks found on the bones.

Phase 2 – 2013. The bones were stored in boxes and in 1970 when OHS left the campus of the Ohio State University, these boxes with other Pleistocene material and nearly "250,000 lots of specimens" entered into a long-term loan to OSU. The term "lot" meant, in some cases, a single bird study skin or a jar of 15 fish fixed in formalin. Other Pleistocene bones were brought to the then new OHS museum at 17th Avenue and I-71, where they continue to be a highlight today.

Last year Dr. Angelika Nelson, curator of the Tetrapod collection at the OSU Museum of Biological Diversity, rediscovered the boxes with Pleistocene mammal bones in the collection and realized that virtually no one was using these specimens at the museum. After contacting OHS and Dale Gnidovec (*right*), Curator of the Orton Geological Museum at Ohio State, she initiated a transfer of the Orleton Mastodon bones to Orton. Dale was enthusiastic and eager to have some of this material available on loan at Orton.

Early in January a team gathered to inventory and catalog the bones of the Orleton Mastodon, and get them ready for the transfer. The team included Dale Gnidovec from Orton, OHS staff members Brad Lepper, Linda Pansing, Bill Pickard, Bob Glotzhober, OHS registrar Lesley Poling and intern Emily Riggins. The inventory work proved to be a much larger task than any of us had anticipated. Bones were in boxes and boxes and still more boxes. They were covered with 60 some years of dust and dirt, and less than well organized. When all was said and done, we labeled and re-boxed 24 boxes of bones.

Here is one "interesting detail" reported in the 1952 journal articles: Ed Thomas and others hypothesized that the small pond (in 1952 only a wet spot in the field) had attracted many animals to drink both before and after the Orleton Mastodon died. As a result, they further presumed, other mastodons likely trampled the bones of the Orleton Mastodon – as many were broken. Some of our boxes now have labels like: "200 +/- Cranial Fragments", or "100 Vertebral Fragments". And we meticulously counted and labeled most of those fragments (some were too small to label and likely to break more just in handling). In all they totaled 2,417 fragments with a few nearly whole bones and teeth.

The outcome of the long day's dirty work – we have a much better inventory of all the bones, and greatly improved labeling and record keeping. Plus, the Orton Geological Museum has them available for research and exhibit.

For the complete text, with a variety of images, view the original January 14, 2013 Blog post.

Impressions on returning to the Museum of Biological Diversity

by Tod Stuessy

Returning to the same location after many years is rarely recommended. For example, one can seek the old tavern where many enjoyable evening hours during university years were spent with friends, often in philosophical discussions, to now find a parking lot. Or one might look for the summer cottage, which provided so many wonderful memories as a child, to discover a new all-season modern house standing in its place. It is better, therefore, to treasure past memories, to not try to recreate them, and instead to put energy into new life experiences.

Against this sound advice, but pleading that life does have occasional uncontrollable moments, my family and I have just returned to Columbus, and I to the **Herbarium** of the **Museum of Biological Diversity**, after an absence of 18 years. Fortunately, there is still a Museum at 1315 Kinnear Road with its wealth of biological collections and not just a parking lot of some new industrial research institute. In fact, the façade of the building has changed little. The only obvious modification is that the Black Horse Inn, which was located just through the fence into the Heritage Apartment area and which used to serve excellent soups

and sandwiches, is now a tavern open only after 3:00 in the afternoon. This change means that there is now no convenient lunch spot within short walking distance of the Museum, and hence, the automobile wins another round.


Tod F. Stuessy

Upon entering the Museum building, struggling as before against the stiffness of the motorized right door, I become aware that the small display area on the right side has now been converted into a classroom to better serve teaching needs of staff from the collections. This seems a useful modification, as the original public display area was too small to be effective, and there was a need for more teaching space. The auditorium serves well for larger gatherings, and the small seminar room works well for small-group discussions, but no satisfactory teaching laboratory existed. This has now been remedied.

The original concept for the **Museum of Biological Diversity** derived from the need to house properly the various biological collections that were located, often in the hallways, in the former B & Z building (now Jennings Hall; here were Acarology, Borror Laboratory, Entomology, and the Herbarium) and Sullivant Hall (Zoology). Most of the space housing these collections was not climate-controlled and pest infestations were commonplace. Furthermore, other units in these two buildings desperately needed more space, and so, internal and external forces eventually resulted in plans for relocation of the collections into a common facility. The first option was into the cavernous underground connecting areas between the buildings of West Campus, which although offering much storage space, did not have proper humidity conditions. Further planning led eventually to the former Food Facility, which was completely gutted and redesigned for use of the collections and associated staff and students. The zoology area initially was one huge room, and during this construction phase, I came with my golden retriever (Baker) and tossed a tennis ball from one end of the room to the other. This was a mammoth space, with high ceiling, later subdivided into the different zoology ranges. Chuck Triplehorn from Entomology suggested the name Museum of Biological Diversity, and this was unanimously adopted.

What, then, really has changed in the Museum? There has, indeed, been a significant modification, but it does not deal with the physical plant—it deals with the administrative umbrella under which the Museum exists. When the Museum was created, the collections belonged to several different departments within the College of Biological Sciences. The Acarology and Entomology collections belonged to the Department of Entomology, which by itself was an administrative hybrid also with the College of Agriculture. The Herbarium resided under jurisdiction of the Department of Plant Biology (formerly Botany), and the zoological collections existed under care of the Department of Zoology. The collections and staff, therefore, bore principal allegiance to their respective home departments rather than to each other in the Museum. The significant change occurred with the formation of the Department of Evolution, Ecology, and Organismal Biology.

With all collections in the Museum now belonging to the same department, this provided a much more cohesive atmosphere among persons within the building. It now becomes more important for staff and students to learn about what other persons might be doing in research and teaching. Seminars from all areas of organismal biology now become more relevant, as it is important to learn the research priorities of persons in the other areas. This is especially important for faculty curators, who now serve more regularly on committees dealing with many types of organisms and research directions.

"In fact, it is no exaggeration to state that any collection in the future that is not databased will likely be marginalized as not being sufficiently modern to fully serve societal needs."

Such a consolidation of all collections under the umbrella of a single department also opened the door to better cooperative public outreach. From the outset, there was little commonality of approach to the general public, with some collections preferring to concentrate solely on research and others taking a greater interest in general education. Now it is obvious, especially as seen in the annual Open House, that public outreach is taken seriously by all collection units. It would also be in the best interest of the one home department, therefore, to encourage public engagement, as this also enhances visibility within its new position in the College of Arts and Sciences. Times have also changed, and it is now a requirement that all academic units show relevance to the general public who help support higher education through their tax dollars.

Another significant modification within the Museum has been programmatic modernization through focus on databasing from the collections. Because the digital age facilitates the search for information in ways never before dreamed possible, it comes as no surprise that all collections of the Museum now have some active databasing projects. Some of these have focused on type materials that are nomenclaturally significant, others on valuable historical specimens, and still others on specific organisms or geographic regions. The important point to emphasize is that the biological features of the organisms are the principal dimensions of interest to the systematic researcher. Many other persons, however, are interested in historical, ecological, demographic, human population impact, and climate-change dimensions that can also be investigated from the data associated with the specimens. In fact, it is no exaggeration to state that any collection in the future that is not databased will

likely be marginalized as not being sufficiently modern to fully serve societal needs. Allied with this capturing of associated collection data comes digital imaging of the specimens themselves, which makes many of the biological features available to the community of systematic (and other) researchers world-wide.

So, in this case was it folly for me to return to the Museum of Biological Diversity after 18 years? Thankfully, no – quite the opposite. The major changes that have taken place within the Museum have not been structural, but rather administrative and programmatic. This is entirely appropriate for any unit that hopes to survive into a competitive future world. Also, in my particular situation, the Director of the Herbarium, Dr. John Freudenstein, has been especially welcoming and provided office space, which supported my successful relocation from Europe and allowed re-establishment of research activities. Do I miss the Viennese coffee houses, the broad elegant avenues, the world-class museums, the concerts and operas? Yes, of course. But every place on earth has its beauty and Columbus is no exception. How one looks determines what one sees.

Tod F. Stuessy was Director of the OSU Herbarium for 15 years and first Director of the Museum of Biological Diversity, 1991-1994. He served as Deputy Director of the Los Angeles Museum of Natural History 1995-1997 and Head of the Department of Systematic and Evolutionary Botany at the University of Vienna, Austria, 1997-2012. He has returned as Emeritus Professor at OSU and has an office in the Herbarium (Room 1350P). ☘

☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘

Follow the Museum of Biological Diversity at Ohio State University *on* Facebook*!*
www.facebook.com/MBDatOSU

☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘

Thanks to all the contributors to this issue!

Frequent Contributors: (in alphabetical order, by last name)

- Marc Kibbey, Associate Curator, Fish Division.
- Luciana Musetti, Curator, Triplehorn Insect Collection.
- Angelika Nelson, Curator, Borror Lab & Tetrapod Division.
- Mesfin Tadesse, Curator, Herbarium.
- G. Tom Watters, Curator, Division of Molluscs.

Other contributors in this issue: (in alphabetical order, by last name)

- Cynthia Dassler, EEOB, Program Coordinator, Curator, Non-vascular Plants, Herbarium.
- Bob Glotzhober, Ohio Historical Society.
- Norman Johnson, EEOB, Professor, Director, Triplehorn Insect Collection.
- Hans Klompen, EEOB, Director, AcarologyLab.
- Stephanie (Wright) Nelson, EEOB, PhD student, Borror Lab.
- Tod F. Stuessy, EEOB, Emeritus Professor, Herbarium.

☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘ ☘

Next issue of the MBDNewsletter coming up Spring Semester 2014

We greatly enjoy hearing from our readers!
Please send your feedback to the Editor
at *osuc-curator@osu.edu*

A gift for biodiversity

Please consider giving to the **OSU Museum of Biological Diversity**. A gift to any of the funds listed below helps support academic excellence, preservation of the collections, training of undergraduate and graduate students, community outreach and much more. We are grateful to our friends for their generosity!

To join our community of supporters, please ***contact*** Samara Preisler, Associate Director of Development (*preisler.7@osu.edu*), (614) 292 6059 **OR go online** to *http://www.osu.edu/giving/collegeofartsandsciences.html*.

Funds Associated with the OSU Museum of Biological Diversity:

- **George and Mildred Wharton Endowment for Acarology Fund** (607675): Supports the Acarology Laboratory.
- **The Hoogstraal Memorial Acarology Student Fund** (603280): Supports Acarology students at the OSU Acarology Summer Program.
- **Donald J. Borror Fund for Bioacoustical Studies** (600654): Supports bioacoustical research, teaching and service programs.
- **D.J. and J.N. Knull Fund in Entomology** (603756): Supports systematic Entomology research and curatorial work in Entomology.
- **The Josef N. Knull Memorial Fund in Entomology** (603759): Supports systematic Entomology research and curatorial work in Entomology.
- **The Ichthyology Research Endowment Fund** (603357): Supports research and publication in the Fish Collection.
- **Friends of the Herbarium Fund** (305104): Supports the OSU Herbarium.
- **The David H. Stansbery Bivalves Endowment Fund** (606910): For the enrichment and maintenance of the Bivalve Mollusc Collection, including expeditions, purchase of collections, and related expenses.
- **The Museum of Zoology Fund** (607989): Supports expeditions, purchase of collections and related expenses of the Museum of Zoology.

Mission

The **OSU Museum of Biological Diversity** houses all the university's biological collections, except fossils. We are part of the Department of Evolution, Ecology and Organismal Biology in the College of Arts and Sciences.

We are dedicated to the ***Preservation***, ***Documentation***, ***Scientific Study*** and ***Interpretation*** of the biological diversity of Ohio, the nation and the world.

We fulfill that mission by:

- building and maintaining extensive collections of specimens and information for future generations;
- creating and disseminating knowledge on evolution and biological diversity through the publication of cutting-edge collections-based research, books, online databases and websites;
- providing service to the broader scientific community through loans of specimens to qualified users for study and identification;
- training the next generation of biodiversity scientists.

Museum Units:

Acarology Laboratory
www.biosci.ohio-state.edu/~acarolog/collection

Borror Laboratory of Bioacoustics
blb.osu.edu

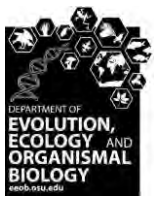
Fish Division
www.biosci.ohio-state.edu/~paleoich

Herbarium
herbarium.osu.edu

Molluscs Division
www.biosci.ohio-state.edu/~molluscs/OSUM2

Tetrapods Division
tetrapods.osu.edu

Triplehorn Insect Collection
osuc.osu.edu



Museum of Biological Diversity
1315 Kinnear Road
Columbus, OH 43212-1157
(614) 292-7773
mbd.osu.edu

2013