

Museum Quarterly

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Letter from the Director...



After a cold and long winter, Spring is finally back in Baton Rouge, with the first waves of Neotropical migrants moving through. I was treated this past weekend to a male Cerulean Warbler singing and foraging in my back yard. During my days as a nest searcher for Dr. Scott Robinson (Univ. Florida) in Illinois, I found several nests of this exquisite species high up in the forest canopy. It's one of my favorite birds.

We have had an abundance of good news around the Museum of late. Two of our doctoral students (**Cathy**

Newman from the Austin lab and **Glenn Seeholzer** from my lab) landed prestigious Doctoral Dissertation Improvement Grants from the National Science Foundation. In addition, doctoral student **Eric Rittmeyer** (Austin) received an NSF postdoctoral fellowship to work on herps in Australia. Congrats to all!

We were also very pleased to learn that LSU alum **Dr. Jason Weckstein** (PhD 2003, Sheldon lab) has accepted a position as Curator of Birds and Assistant Professor of Biology at the Academy of Natural Sciences of Drexel University. The Academy of Natural Sciences is one of the oldest and most important collections in North America, but has been without a curator for several years now. Kudos to ANSP Collection Manager Dr. Nate Rice and the rest of their curators and faculty for making this happen. We look forward to watching Jason's boundless energy put to work there and wish he and his family the best in their upcoming move. Naturally, we claim a hand in Jason's success for providing his graduate training, as we do all of our alums. :-)

Inside you'll see an announcement for our spring ornithology fundraiser, the Louisiana Birdathon. If you've supported it in the past we hope you'll help it out again. If it has been a while or you've never supported it, please consider helping it this year. All of these funds go to supporting graduate student bird research at the Museum, including participation in expeditions, DNA sequencing supplies, and travel to meetings. Even a small contribution can have a big impact on a graduate student's career, and that feeds directly into the successes I mentioned above.

Enjoy your Spring,
Robb



Study On Evolution of Ovenbirds Featured in The Journal *Nature*

A new study by Museum Director **Robb Brumfield**, former Museum postdoc **Dr. Elizabeth Derryberry** (now a professor at Tulane University), and recent Museum graduate **Dr. Santiago Claramunt** (now a postdoc at the American Museum of Natural History), in collaboration with Museum friends at Oxford University Dr. Joe Tobias and Dr. Nathalie Seddon (they led the study), determined that species living together in close proximity are not forced to evolve differently to avoid competing with each other, challenging a theory that has held since Darwin's "Origin of Species."

The study focused on ovenbirds, one of the most diverse bird families in the world, to conduct the most in-depth analysis yet of the processes causing species differences to evolve.

"To understand how and when these bird species evolved required reconstructing their tree of life. To do that, we extracted and sequenced DNA from tissue samples in the Museum's Collection of Genetic Resources, which is the largest collection of its kind in the world at over 62,000 bird tissues," said **Robb Brumfield**, Museum Director, Curator of Genetic Resources and Roy Paul Daniels Professor of Biology at LSU. "Studies such as this are only possible because of the 30+ years of field expeditions by ornithologists lugging nitrogen tanks to far flung places of the world. This frozen tissue collection is quite literally an international treasure, buried right here in the basement of Foster Hall."

With the growing importance of molecular and genomics studies (which rely heavily on DNA extracted from frozen tissues), the use of this collection has increased dramatically over the last decade. The tissue samples are used for a wide variety of studies in forensics, epidemiology, conservation, wildlife management, comparative

molecular genetics and phylogenetics.

"We have a permanent genetic record of these organisms, preserved in liquid nitrogen for future researchers who could be working thousands of years from now," **Brumfield** said.

Accompanying each tissue sample is a specimen in the museum's bird collection, which features more than 175,000 specimens.

"Because we have both a tissue sample and the specimen for each individual, we can begin to understand the connection between genotype and phenotype," he explained. "A nice aspect of this study was that it integrated elegant analyses of morphology using traditional museum specimens with cutting edge DNA analyses. And the results were surprising. It was long thought that different species were able to persist in a diverse community by evolving individual differences that reduced competition, but our data showed that these differences evolved long before the community was formed."

The international research team, comprised of scientists from Oxford, LSU, Tulane, Lund University in Sweden and the American Museum of Natural History in New York, found that although bird species occurring together were consistently more different than species living apart, this was simply an artefact of species being old by the time they meet. In fact, once variation in the age of species was accounted for, coexisting species were actually more similar than species evolving separately, opposite to Darwin's view, which remains widely-held today.

"It's not so much a case of Darwin being wrong, as there is no shortage of evidence for competition driving divergent evolution in some very young lineages," said Joe Tobias of Oxford University's



The Red-billed Scythebill (*Campylorhamphus trochilirostris*), a woodcreeper from the ovenbird family.

Photo by Joseph A. Tobias.

Department of Zoology, who led the study. “But we found no evidence that this process explains differences across a much larger sample of species. By using genetic techniques to establish the age of lineages, we found that most ovenbird species only meet their closest relatives several million years after they separated from a common ancestor. This gives them plenty of time to develop differences by evolving separately.”

The study, published in *Nature*, compared the beaks, legs and songs of more than 90 percent of ovenbird species. Although species living together had beaks and legs that were no more different than those of species living apart, the most surprising discovery was that they had songs that were more similar. This challenges some longstanding ideas because the standard view for the last century has been that bird

species living together would need to evolve different songs to avoid confusion.

“Looking at the bigger picture, ‘be different or die’ doesn’t appear to explain evolution,” said Tobias. “Ovenbird species use a wide variety of beaks, from long and hooked to short and straight, but these differences appear to evolve when living in isolation, suggesting that competition is not the major driving force producing species differences. Instead, it seems to have the opposite effect in promoting the evolution of similar songs.”

Tobias explained that the reasons for this are difficult to explain and require further study, but they may have something to do with the advantages of using the same “language” of similar aggressive or territorial signals.

“For instance, individuals of two closely related species with similar songs may benefit because they are able to defend territories and avoid harmful territorial contests not only against rivals of their own species but those in other species coexisting in the same places and competing for similar resources,” he said.

According to Nathalie Seddon of Oxford University, co-author of the study, the novelty of this research comes from the fact that it accounts for a species’ evolutionary age.

“A first glance at our data suggests the same patterns that Darwin had expected. It is only when accounting for the fact that species vary

in age, and then comparing between lineages of similar age, that the picture changes,” she said. “These insights are the result of a hugely collaborative venture, and a good example of standing on the shoulders of giants. It took almost a decade to compile genetic sequences and trait measurements from 350 lineages of ovenbird. The song recordings were made in over 20 countries by numerous tropical ornithologists, including ourselves, and the museum material was based on specimens collected by hundreds of individuals stretching back to the famous British naturalist Alfred Russell Wallace in the 1860s.”

The research was funded by the Oxford University John Fell Fund, Queens College, Oxford, The



In Pursuit of *Echiothrix*

There is no other... island so closely surrounded by other islands on every side, yet preserving such a marked individuality in its forms of life...

That's how Alfred Wallace, the father of biogeography and co-discoverer of natural selection described Sulawesi, a large island in central Indonesia, in *Island Life*. Wallace's foundational book on island biogeography was published in 1880 and, at the time, very little information was available on Sulawesi's biodiversity. Wallace was aware of some of the island's most charismatic mammals such as the babirusa (*Babirusa babirusa*), crested macaque (*Macaca nigra*), and Sulawesi cuscus (*Phalanger celebensis*), but had little inkling of the many small, nocturnal species now known from the island. Nevertheless, Wallace was spot on—Sulawesi's fauna is indeed unique. In fact, arguably every native, non-flying mammal currently known from the island is an endemic species, and many of these present strange morphologies not seen elsewhere. All of this is surprising, as Wallace noted, given Sulawesi's close proximity to the diverse faunas of Asia and Australia.

Four years ago, I began a project to inventory small terrestrial mammals on Sulawesi. My interests, and those of my collaborators (Anang Achmadi from the Indonesian Institute of Sciences and Kevin Rowe from Museum Victoria), were based in regional biogeography. We wanted to understand how Sulawesi's unique mammal fauna had been assembled. Had ancestral species colonized the island rarely, with speciation taking place on the island and generating the many endemic forms of life now known? Or had colonists arrived frequently, with the diverse forms now present delivered by floating rafts of vegetation, arriving on Sulawesi beaches alive, well, and able to reproduce?

Approximately 35% of the ~130 mammal species known from Sulawesi are rats in the family Muridae, and hence they have represented a major component of our inventory efforts from the beginning. These animals span a range of ecological traits, including diurnal insectivores (*Melasmothrix naso*), large woolly rats with tufted rumps (*Eropeplus canus*), small arboreal fruit eaters (*Haeromys montanus*), and montane worm-eating specialists (*Paucidentomys vermidax*).



Before we started fieldwork on Sulawesi, one particular group of rats, those known as the “shrew rats,” had caught our attention. These animals include a handful of species spread among several endemic genera. They share with each other a set of morphological and behavioral characteristics not seen in other Sulawesi rats. For instance, shrew rats all have long faces and small eyes relative to most rats, feed entirely on invertebrates, and lack the iron deposits on the anterior face of their incisors that color other rodent incisors orange. Ecologically and morphologically similar groups of species have long been

Tateomys rhinogradoides, a Sulawesi shrew



known from the Philippines (also known as “shrew rats”) and New Guinea (“moss mice”), but it has never been clear whether the Sulawesi shrew rats were related to one another or to the geographically independent groups in other regions. Thus, our goals have been to collect specimens of these rats and use their genetic traits to determine their phylogenetic relationships. This would tell us whether the characters shared among Philippine and Sulawesi shrew rats and New Guinea moss mice are the result of convergent evolution or shared ancestry.

Early this year, I spent the month of January surveying small mammals on Mt. Buliohuto, which lies on the north peninsula of Sulawesi. This collecting trip represented our fourth year of inventorying mammals on the island, and ultimately, it would feel like we had crossed a major threshold of success. By late 2012, we had inventoried mammals on five mountains and obtained specimens and genetic samples from nearly all the genera of Sulawesi shrew rats, including a remarkable new genus (*Paucidentomys vermidax*) we first discovered on Mt. Latimojong. Many of the species we were finding had not been seen in decades, so we were feeling confident about our abilities to catch these animals. It seemed we were well on our way to being able to answer our questions about the origins of shrew rats, but *Echiothrix* continued to elude us.

Echiothrix is the largest of the Sulawesi shrew rats, with adults weighing about 250 grams. The genus includes only one or two species (*E. leucura* and *E. centrosa*) and is known only from lowland habitats, with most records from the north peninsula. By the end of 2012, all our survey sites were in the central core, the eastern, or the southeastern peninsula of Sulawesi. In some ways, it was not surprising that we had not found *Echiothrix*—we had only sampled one locality near a site where the animals had been recorded in the past. However, species’ geographic distributions are so poorly documented that we never believed that *Echiothrix* was truly restricted to the areas where it had been collected by earlier mammalogists. In fact, most of the shrew rats we had captured in our first two years were extra-limital records, captured outside the species’ known ranges. Rather, we were concerned that the genus might be restricted to lowland forests, which have been greatly reduced by habitat conversion and thus perhaps *Echiothrix* was very rare. In reality, we were making slightly educated guesses based

on little information, but that was all we had to go on.

In early 2013, we decided to go whole-hog to work up the north peninsula in pursuit of *Echiothrix*. We decided to first survey sites on Mt. Dako, on the west side of the north peninsula and later to work on a site to the east of Dako. We recruited some additional help, bringing Jim Patton, a retired mammalogist from the Museum of Vertebrate Zoology, along to sample the lowland habitats while the younger folks surveyed the montane habitats. Heru Handika, a student from Andalas University, also joined us and he and Jim would work together in the lowlands.

After a week of scouting potential sites around Mt. Dako, we had successfully located a suitable lowland site, but we had not been able to get into the highlands on day hikes, so there was some uncertainty there. Our guides had assured us they could take us to a place that was in the mossy forest above 1500 m and that there were good places to camp near water. Because of our two-camp strategy, we needed over 60

porters to transport all our gear and food, which filled 3 vans. There were not enough people in the village (Malangga Selatan, Toli Toli) where we would begin our hike, so we asked our guides to recruit folks from neighboring villages while we were in the city purchasing supplies. After a long day of buying groceries, tarps, and other supplies, we packed all our belongings into rice sacks and attempted to distribute the weight evenly. The following morning we drove back to Malangga Selatan ready and excited to go. The anticipation at this stage is always palpable because we have usually spent 2-3 weeks working on permits and traveling by the time we arrive at a site, ready to begin fieldwork. The urge to do something useful is often intense.

Upon our arrival, the villagers, including our guides from the past week, were surprised to see us and asked what all the gear was for. We explained that we were ready to go into the mountains for two weeks to catch mammals, just like we had said two days earlier. They were clearly not expecting this and told us there's no place to camp at high elevation—no water on top of the mountain they said. We were shocked—we had already spent several days hiking around the area looking for suitable places to work and had explained repeatedly what it was we wanted to do. It was becoming clear that the persistent language barrier we had been dealing with, with translations passing through four very different languages, had totally bamboozled us. The villagers had no idea what we wanted—

they were simply happy to get paid to walk around in the woods with us and answered “yes” to most questions. After a couple hours of further explanations, we convinced them to help us get all our gear up to the low-elevation site we had selected. We would later try to move half of the supplies and people to a high elevation site, once we located a suitable place. The hike to the low camp took 3–4 hours and involved some tricky ledges and river crossings, but everyone made it in one piece. Even the 10 flats of eggs were intact. We set up the camp for the lowland team just before dark, once again feeling happy to be back in the forest.

The following morning I set out with two guides (Jamuddin and his younger brother Jamal), Kevin, and Heru to look for a high elevation site, while Jim began trapping the lowlands. Our guides were still swearing there was no water on top of the mountain, but we carried images from Google Earth stored on a tablet computer, and could see large rivers from space. Moreover, it rains so much in the mountains that there had to be water. We had no idea why the local people would insist there was no water, but we were confident we could find some. As we set out on this scouting trip, we carried just enough food and shelter to get by for three days. We thus made our way up the river, travelling light, following the canyon for a good five hours before stopping for lunch at about 1000 m elevation. We were climbing quickly, but the habitat had not yet shifted to the montane vegetation type

where oaks, chestnuts, and mosses are common. After lunch we continued hiking, using the Google Earth images and a GPS unit to choose our direction. After lunch we climbed some brutally steep slopes to get out of the river canyon and made it to a ridgetop at 1600 m elevation by 4pm. At this point the habitat had changed dramatically—it was exactly what we were looking for. A mossy forest that we expected would house completely different species than would be caught in the lowlands. It was a relief to have made it to a suitable habitat, but we needed to find a place to camp, and it had to have water. We talked amongst ourselves and asked our guides which way they thought best to go looking for it. Jamal indicated that there was a small stream just 100 m down the other side of the ridge! He led us straight to it, and we set our camp there for the night, right next to the water. This was baffling, but we were tired and hungry and didn't dwell on it. We ate some food, and as dusk arrived, it began raining. Hard. We climbed into our tent and quickly fell asleep, as it continued to rain. About 10 pm, we woke up and realized our tent was flooding. Our sleeping bags wet, with water pooling up inside the tent, we bathed ever-so-briefly in irony. We quickly escaped the tent and moved under the small tarp we had brought. The five of us huddled there on a small log, cold, wet, and tired, for several hours before the rain eased up and we were again able to sleep.

In the morning, the skies were clear and Heru and Jamal went down the mountain to round up

another batch of porters and send up our gear so we could get started. Kevin, Jamuddin, and I spent the day slowly clearing enough space for our camp. All 30 bags and Anang arrived two days later. We started trapping the next day. Although *Echiothrix* was our primary target, we expected Jim and Heru would be more likely to get it in the lowlands, but one never knows. We trapped these two sites for a full two weeks, collecting 12 species of rats, 6 species of shrews, and 2 species of squirrels. Among the rats and shrews were several new species, including a strange new shrew rat with a hog's nose, but alas, no *Echiothrix*. Not from either site.

At the end of this trip, we left happy about our new discoveries, but lamenting our inability to find *Echiothrix* or successfully communicate with the people of Malangga Selatan. We still don't know why they told us there was no water, but our suspicion is that our most senior guide had simply never been that high up Mt. Dako and was ashamed to admit his ignorance, while our younger guides did not wish to contradict him. This, combined with the language barriers certainly caused a great deal of confusion, but we managed to get through it, and obtained the first significant mammal collections from this part of Sulawesi. These misunderstandings often happen with fieldwork at remote sites, but they make the research successes all the more satisfying.

After returning home and the passage of a few weeks, we had forgotten all the frustrations of the previous trip and began planning our next excursion. We would move east of Mt. Dako this time, sampling one of the mountains in the Gorontalo region. After our confusing experience on Mt. Dako, we decided to put Google Earth to even heavier use as a navigational tool. Kevin planned several possible access routes into various mountains, mapping them out in detail on stored satellite images. After a week of negotiating with government officials over where we should conduct

our research, we settled on Mt. Buliohuto, in North Gorontalo. Armed with the digital satellite images, we hired a car and drove directly to an access point on the north shore of the peninsula, following our progress on the tablet. Driving to a predetermined destination may sound simple enough, but navigating a maze of unnamed and unsigned roads is normally very difficult and requires constant stopping to ask for directions. But this time the satellite images and GPS allowed us to drive straight to our destination, without even knowing the name of the village we were bound for. As we approached our destination we reached an impassible river crossing in the road, got down from the car, and walked a short distance to the village where we hoped to find a guide. We knocked on the first door we came to and asked the man that answered to guide us for the day. He was willing and we set off a few minutes later and hiked through a few farms before entering disturbed forest, followed shortly by pristine lowland forest. We continued along this trail, occasionally consulting our navigation system to make sure we were heading toward the mountain, not away from it. After two hours, we reached a flat place along a small river and decided we would establish a lowland camp there. If all went well, we would move up the mountain to establish a high elevation camp after 10 or so days of trapping the lowlands. This all went very smoothly. It felt too easy.

We returned to the car and asked our guide, Jamal (no relation to Jamal from the previous site), to recruit others to help deliver our bags to the

Anang Achmadi (left) and Jim Patton (right) on Mt. Dako



campsite. We promised we would be back in two days. After we returned to the city of Gorontalo, we purchased enough supplies to last us ~18 days in camp. When we arrived back at the village the next day, it was raining heavily, and none of the porters we hoped would meet us at the river crossing were there, which brought back memories of Mt. Dako. We waited, and after a couple hours, people started to trickle in as the rain eased. We were a smaller group this time and the trail was easy, so we needed only about 20 porters. But the village was small and we were only able to round up 8 that were willing to hike so close to dusk. So we prioritized our bags and made a first trip in with as much as we could carry. We set up our camp that afternoon, and the next morning another batch of porters delivered our remaining supplies.

We started trapping this forest, and our capture rates were high enough that we were not able to set our usual allotment of ~350 traps. We were catching loads of *Maxomys* and *Paruromys*, along with a few *Bunomys*, *Haeromys*, and *Rattus*, but no shrew rats. This went on for a week, without finding any additional species, so we were starting to feel our inventory of rats was complete. We decided to give it a few more days and then would attempt a move to higher elevation. Kevin and I continued to trap the areas around our camp, while Heru and one of our guides (Riti) looked for suitable places to camp at higher elevation. On their third day of scouting, they found a good place to set up a new camp at about 1200 m elevation, with relatively easy access to potential trapping areas around 1500 m elevation. This sounded great so we proceeded to make arrangements for porters to help us move all our gear.

A couple days later, 20 porters arrived in our camp, right on time and apparently ready to go. As we were finalizing our packing and villagers were selecting which bags they would carry, one among them started trying to re-negotiate the agreed-upon price. We scoffed at this change of plans since we had agreed to the first price they asked for. It

seemed fair so why not? Unfortunately the one porter was not happy and he somehow convinced the others (in a language none of us understood) that they should leave. He largely succeeded, and 19 of them left, with only one remaining. We were shocked. We had all been through many tense negotiations with porters in the past, and none of us had ever seen a group of porters walk away from a job. We didn't fully understand how this deal had suddenly fallen apart, but it was clear we were stuck. If we used the three guides that had



Our high elevation crew on Mt. Dako, from left to right, Kevin Rowe, Mardin Sarkam, Anang Achmadi, Jamuddin, Jake Esselstyn, and Jamal.

been working with us for the past week, and the one porter who stayed behind, to move all our gear up high, it would take 3-4 days of hiking back and forth. This would eat up much of our remaining time, so we decided to set a satellite camp up high instead. I would trap the montane areas alone, with only the bare essentials of gear that I could get up the mountain with four porters. Kevin and Heru would continue trapping the lowlands. Our guides would take turns going up and down the mountain each day. One would bring food up to me each morning and another would carry specimens down the mountain each day. This would allow me to stay at the high elevation site, while only needing to move a bit of camping gear and a bunch of traps. We set out to do this immediately.



Our lone specimen of *Echiothrix*.

After a couple days I had set all my traps at high elevation and settled into a routine.

I checked my traps in the morning, recovering animals as quickly as possible, hoping to beat the rain that invariably started around 11 am and often continued all day and much of the night. I was catching many animals, including a couple species of *Maxomys* and *Rattus* that we had not gotten in the lowlands. This was all well and good, but still there were no shrew rats and there was a touch of disappointment each morning. Kevin and Heru continued to trap the lowlands, and I assumed they were still catching the same species.

However, our failed negotiation with the porters would turn out to be truly serendipitous. Had we succeeded, we would have quit trapping the lowlands after 10 days—what happened on the 12th day would not have taken place. This one particular morning, Kevin and Heru, unbeknownst to me at the time, caught a large male rat with a long face and spiny fur in the lowlands—it was *Echiothrix*! We finally had one specimen of *Echiothrix*. Caught on our eighth mountain, after a cumulative eight months of fieldwork. We continued trapping for several days after that lucky morning, but we would not see *Echiothrix* again. We only had one specimen, but the genetic

information we can extract from that one animal will finally allow us to test those hypotheses regarding the origins of shrew rats and moss mice. While Kevin and Heru were working happily those last few days knowing they had already gotten our main target, they thought it better to let me labor in ignorance at the high camp. I am glad they did—when I came down the mountain a few days later, feeling tired, hungry, and ready to go home, they gave me no hints of their excitement, but rather coolly suggested I examine their skins to make sure they were drying properly. I did this, and after a moment of gazing at the condition of one tray of specimens, I spotted the *Echiothrix*—it gave me the same thrill I know it gave Kevin and Heru when they first saw it the trap. A spiny, worm-eating rat, on which we had pinned so many of our hopes, had finally taken the bait.

Keep your eyes out for publications on these fascinating animals in the coming months.

Eagle Expo 2014

Donna Dittman



Bald Eagles are very numerous in the Morgan City area and participants on the Turtle Bayou trips often get great views of eagles of all ages – here an adult has just launched from a treetop along the bayou. Photo by **Donna L. Dittmann**

The LSU Museum of Natural Science was again a sponsor at the 9th Annual Eagle Expo in Morgan City, Louisiana. This year's event was held 20-22 February and included seminars, a photography workshop, a live raptor presentation, and boat tours of area swamps and marshes. LSUMNS Collection Managers **Donna L. Dittmann** and **Steven W. Cardiff** assisted for the seventh year, again leading boat tours to Turtle Bayou on the Friday and Saturday of the Expo. Two boats are provided by Louisiana Universities Marine Consortium (LUMCON) for the Turtle Bayou trips. Always an exciting trip, participants are routinely treated to dozens of Bald Eagles just during a 2-3 hour trip. This year's counts were somewhat lower than in recent years, but the 2014 tours still encountered about 40-50 individual eagles per trip. It's a great way to learn about Bald Eagles,

learn to identify eagles of different ages, and even see adults tending their nests and nestlings. Turtle Bayou hosts dazzling numbers of other birds, including various waterfowl, waders, other raptors (including close-ups of Great Horned Owls), gallinules, coots, shorebirds, and Tree Swallows. These tours are especially good for close-up views of Anhingas, Ospreys, Red-shouldered and Red-tailed hawks, Great Horned Owls, and Belted Kingfishers, and other wildlife such as Nutria (a staple food of the eagles!) and alligators. The scenery alone is worth the trip.

If you'd like to find out more about Eagle Expo or are interested in attending next year's event, information will be posted at the Cajun Coast Visitors and Convention Bureau website: <http://www.cajuncoast.com>



<-- One of the LUMCON boats touring Turtle Bayou stops to look for the Great Horned Owl at its nest. Whether participants take this trip to see eagles, go birding, or just for general photography, it's a great time for all.



<-- Bald Eagles are the star of the show. After seeing lots of adults, then participants can learn how to age individuals by studying their plumage, such as this immature individual starting its flight feather molt. Both photos by **Donna L. Dittmann**.



LSUMNS hosts the Annual Meeting of the Louisiana Bird Records Committee

The Louisiana Bird Records Committee (LBRC) met for its annual meeting at LSUMNS on 15 March 2014. Museum Staff **Donna L. Dittmann** (Secretary and Voting Member) and **Steven W. Cardiff** (Chair and Voting Member) are currently LBRC officers. At the annual meeting the committee reviews and votes on the validity of numerous records of rare bird species, holds elections, and discusses other business. Following the meeting, the LBRC produces an annual newsletter; **Donna** is the newsletter editor, and **Donna** and **Steve** author the Annual Report. To see this year's (usually on line by early May) or past LBRC newsletters, visit: <http://www.losbird.org/lbrc/lbrc.htm>

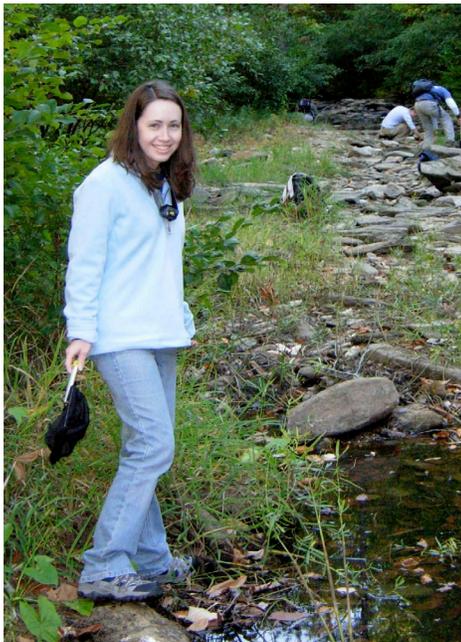
Documentation reviewed at the annual meeting included material submitted by LSUMNS personnel for a number of records, including Louisiana's 3th state records of Iceland Gull (2013-019) and Fork-tailed Flycatcher (2013-025).



Above: Iceland Gull (LBRC record No. 2013-019) at the Mandeville lakefront on 23 November 2013 (photo by **J. V. Remsen**)

Left: Fork-tailed Flycatcher (LBRC 2013-025) at Grand Isle 20 April 2013 (photo by **Donna L. Dittmann**)

Grants and Research Funding



The last several months have been exciting in the Herp Division. In February PhD student **Cathy Newman** was awarded a **National Science Foundation Doctoral Dissertation Improvement Grant** (commonly called a DDIG). These Federal grants are highly competitive and such an award is a major accomplishment for a graduate student. The title of her DDIG is “Systematics and evolutionary history of the southern redback salamander: using next

generation sequencing with organisms with large genomes.” The grant award is \$19,240 and her research will be the first study to use a next-generation DNA protocol to generate a within-species genome-wide data set of 400-800 million DNA sequence fragments for her study salamanders. Results from her study will inform salamander conservation, amphibian systematics, and evolutionary biogeography. Her work will have special relevance for the future of systematic studies of organisms with large genomes. The southeastern United States is a hotspot for amphibian biodiversity, but many amphibian species in the region are undergoing rapid declines. This is especially true for salamanders, which are incredibly diverse in the Southeast. Examining genetic relationships, climate factors, and how a species’ geographic distribution has changed through time can increase understanding of the mechanisms influencing species generation and decline. The goals of this project are to combine new methods of DNA



sequencing with geographic and environmental information to test hypotheses about the within-species evolutionary relationships of the southern redback salamander and changes in its geographic distribution through time. Salamanders have genomes approximately 10 times larger than humans, and this large size can pose problems for the new genome sequencing methods. This project will test the utility of a newly established DNA sequencing protocol in resolving within-species evolutionary relationships for species with large genomes. In addition, this project will have important conservation implications, as the redback salamander is listed as **Critically Imperiled in Louisiana** and as a Species of Special Concern in Arkansas.



A rare Louisiana redback salamander (*Plethodon serratus*) from Kisatchie National Forest.

In March PhD student **Eric Rittmeyer** was awarded a National Science Foundation International Postdoctoral Fellowship. 'Highly competitive' does not express the difficulty of landing one of these prestigious grants. **Eric** will be graduating in August 2014 then taking his NSF grant to Australia where he will be joining the lab of Dr. Craig Moritz (http://biology.anu.edu.au/craig_moritz/) at the Australian National University. **Eric** will be undertaking research in both New Guinea and Australia using new genomic methods and computational approaches to better understand the role that barriers such as rivers, mountains, or unsuitable habitats play in driving species diversification. His research focuses on the hyper diverse regions of New Guinea and the Australian wet tropics.



PhD student, soon to be Dr., **Eric Rittmeyer** at the Lae harbor in Papua New Guinea during the Herp Division's 2013 expedition.

Undergraduate Research

The museum plays a critical role in training the next generation of biologists. Undergraduate research is pivotal in helping students understand the excitement and challenges of research. The last few months have been an exciting time for the Herp Division.

Jeff Weinell is wrapping up an impressive undergraduate research project examining the genetic and geography of scarlet snakes (*Cemophora coccinea*) in order to infer phylogeographic patterns for the species. He is graduating in May and will be starting a masters program at Villanova working with Dr. Aaron Bauer and Dr. Todd Jackman.

Oliver Siquefield successfully defended his undergraduate honors thesis titled 'A Study of

Biliverdin, Serum Albumin and Hemoglobin in the Scincid Lizard, *Prasinohaema*.' **Oliver** will be graduating in May and has been accepted into the medical school at LSU New Orleans.

Former undergraduate **Lauren Oliver**, now a PhD student at the American Museum of Natural History in New York city, had her LSU honor's thesis work published in 2013. A highly prominent National Science Foundation Graduate Research Fellowship is funding her PhD. Her paper published in 2013 in the journal *Molecular Phylogenetics and Evolution* examines the genetics and biogeography of a wide spread New Guinea frog. Her results show that there are multiple cryptic species and that the diversity is greatly underestimated in the group. She was also part of the LSU Herp Division's 2013 New Guinea expedition.



Former undergraduate **Lauren Oliver** recording a frog mating call for her PhD research in Kamiali village Papua New Guinea in 2013 with curator **Dr. Chris Austin**.

Publications

2013 was a productive year for the Herpetology Division with 10 papers published. Division authors include several undergraduate and graduate students as well as national and international collaborators. All of these publications can be downloaded free of charge from the Herpetology lab page (<http://www.museum.lsu.edu/Austin/lab.html>):

C.T. McAllister, D.W. Duszynski, R.N. Fisher, C.C.

Austin (2013). Three new species of coccidian (Apicomplexa: Eimeridae) from skinks, *Lipinia* spp. (Sauria: Scincidae), from Oceania. *Journal of Parasitology* 99(6):1086-1088.

McAllister, C. T., R. S. Seville, D. W. Duszynski, S. E. Bush, R. N. Fisher, and C. C. Austin. (2013). Two new species of *Eimeria* (Apicomplexa: Eimeriidae) from emerald tree skinks, *Lamprolepis smaragdina* (Sauria: Scincidae) from Papua New Guinea and the Philippines. *Systematic Parasitology* 86:165-171.

McAllister, C.T., Seville, R.S., Duszynski, D.W., Fisher, R.N., and C.C. Austin (2013). A new species of *Eimeria* (Apicomplexa: Eimeriidae) from *Carlia* spp. (Sauria: Scincidae) from Papua New Guinea. *Systematic Parasitology*, 86(1):53-57.

Eckstut, M.E., A.M. Hamilton, and C.C. Austin (2013). Variable unisexuals and uniform bisexuals: morphology of the *Nactus pelagicus* complex (Reptilia: Gekkonidae) on Tanna Island, Vanuatu. *Herpetologica*, 69(2):199-213.

Jackson, N.D. and C.C. Austin (2013). Testing the Role of Meander Cutoff in Promoting Gene Flow across a Riverine Barrier in Ground Skinks (*Scincella lateralis*). *PLoS ONE*, (8)1: e62812

Oliver, L.A, Rittmeyer, E.N, Kraus, F., Richards, S.J. and C.C. Austin (2013). Phylogeny and phylogeography of *Mantophryne* (Anura: Microhylidae) reveals cryptic diversity in New Guinea. *Molecular Phylogenetics and Evolution*, 67 (2013) 600–607.

Böhm et al. (2013). The conservation status of the world's reptiles. *Biological Conservation*, 157 (2013) 372–385.

Linkem, C.W., R.M. Brown, C.D. Siler, C.C. Austin, D.T. Iskandar, A.C. Diesmos, J. Supriatna, N. Andayani, and J.A. McGuire. (2013). Stochastic faunal exchanges drive diversification in widespread Wallacean and Pacific Island lizards, (*Squamata*: Scincidae: *Lamprolepis smaragdina*). *Journal of Biogeography*, 40(3): 507-520.

Carstens BC, Brennan RS, Chua V, Duffie CV, Harvey MG, Koch RA, McMahan CD, Nelson BJ, Newman CE, Satler JD, Seeholzer G, Posbic K, Tank DC, Sullivan J (2013). Model selection as a tool for phylogeographic inference: an example from the willow *Salix melanopsis*. *Molecular Ecology*, 22, 4014-4028.

Spinks PQ, Thomson RC, Pauly GB, Newman CE, Mount G, Shaffer HB (2013). Misleading phylogenetic inferences based on single-exemplar sampling in the turtle genus *Pseudemys*. *Molecular Phylogenetics & Evolution*, 68, 269-281.

The Re-launching of the *Occasional Papers of the Museum of Natural Science, LSU*

We are pleased to announce a reboot of the *Occasional Papers of the LSU Museum of Natural Science* publication series. The *Occasional Papers* was started by the founder of the LSUMNS, **George Lowery, Jr.**, in 1938, just two years after he founded the museum itself. The journal was closely modeled after the *Occasional Papers* series of the University of Michigan's Museum of Zoology. There is a long tradition of museums having their own publication series, perhaps best known among these are the *Novitates* and *Bulletin* series from the American Museum of Natural History. There have been 80 publications in the LSUMNS series from 1938-2007 covering various topics in natural history, and mostly, but not exclusively, written by museum curators, postdocs and graduate students.

The journal is now open access and available online for free (<http://www.museum.lsu.edu/occpap.html>). It is free to publish in the journal, and all manuscripts are rigorously reviewed (double-

blind). The journal is now available through several important library collections including LSU, the American Museum of Natural History, University of Michigan, Indiana and soon many others. Two new scholarly articles have been published in the series since the re-launch. Number 81: "Notes on bird species in bamboo in Northern Madre de Dios, Peru, including the first Peruvian record of Acre Tody-Tyrant (*Hemitriccus cohnhafti*)" by LSU MNS graduate student **Mike Harvey** and others; and Number 82: "Notes on the avifauna of the floodplain forest of the Rio Mamoré, Beni, Bolivia, with a description of the Juvenile plumage of Unicolored Thrush (*Turdus haplochrous*)" by LSU MNS graduate student **Ryan Terrill** and others. We look forward to future submissions and publications in the journal and hope that it helps inspire more museum-based research.

-New Occasional Papers Editor, Prosanta Chakrabarty

Number 81

February 28, 2014

OCCASIONAL PAPERS OF THE MUSEUM OF NATURAL SCIENCE

LOUISIANA STATE UNIVERSITY
BATON ROUGE, LOUISIANA 70803

NOTES ON BIRD SPECIES IN BAMBOO IN NORTHERN MADRE DE
DIOS, PERU, INCLUDING THE FIRST PERUVIAN RECORD OF ACRE
TODY-TYRANT (*HEMITRICCUS COHNHAFTI*)

MICHAEL G. HARVEY,^{1,6} DANIEL F. LANE,¹ JUSTIN HITE,² RYAN S. TERRILL,¹ SHEILA

FIGUEROA RAMÍREZ,³ BRIAN TILSTON SMITH,^{1,4} JOHN KLICKA,⁵ and WALTER

VARGAS CAMPOS³

Hall of Distinction

Congratulations to the LSU Tigrisomas (the champion bird rally team)! Recognized at the 2014 Hall of Distinction (**Mike Harvey, John Mittermeier, Glenn Seeholzer, Dan Lane and Ryan Terrill.**)

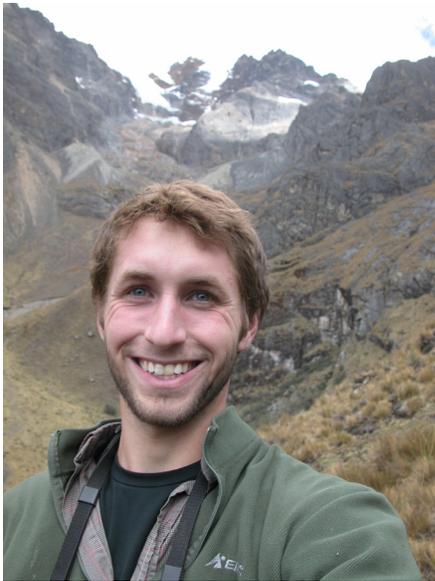


Collection of Genetic Resources Undergraduate Accepted to Med School



If you've received a tissue loan from the Collection of Genetic Resources in the last few years, chances are Mr. **Jonathan Schouest** had a hand in preparing it. Jonathan has been providing much-needed assistance in processing the thousands of tissue samples loaned each year to researchers around the world. This Fall Jonathan will continue honing his skills with a scalpel when he begins medical school at LSU in New Orleans. Congratulations **Jonathan!** In addition to his academic prowess, **Jonathan**, a New Orleans native, is a 3-point specialist, sinking critical buckets in the LSU professor basketball league in which **Robb Brumfield, Prosanta Chakrabarty**, and **Jake Esselstyn** play.

Glenn Seeholzer Lands Doctoral Dissertation Improvement Grant from the National Science Foundation



Determining the evolutionary mechanisms responsible for speciation is critical to understanding the origins of biodiversity. Geographic isolation is a key requirement of the speciation process yet the prevailing ecological context in which populations become isolated is unclear. On the one hand, if two populations of the same species occur in different environments this may cause them to diverge ecologically due to local adaptation. Alternatively, little environmental differences may exist within a species' distribution due to conserved ecological preferences. If this distribution is divided by a region outside its ecological preferences, such as mountains for a lowland organism, dispersal will be inhibited.

The goal of the study is to test these alternative hypotheses at multiple evolutionary scales in a species rich group of South American birds, the ovenbirds and woodcreepers (family *Furnariidae*) (Figure 1). Across the family, there is a positive relationship between the rate of ecological divergence and speciation. Importantly, the arboreal spinetails (genus *Cranioleuca*) exhibit rates of ecological divergence and speciation far exceeding those found in other groups in the family (Figure 2). Both observations support the hypothesis that ecological divergence is associated with speciation, but to test these hypotheses a densely sampled phylogeny is needed. This study will reconstruct the evolutionary relationships of the arboreal spinetails using genomic scale genetic datasets. We will then use detailed comparative analyses to determine if speciation in this group is associated with ecological divergence or conservatism.

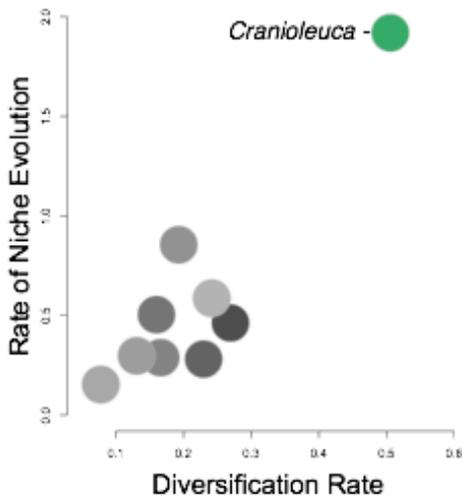


Figure 2. The *Cranioleuca* radiation (green) exhibits the highest rate of diversification and niche evolution relative to the other major subclades in *Furnariidae*.

This study will foster inter-institutional and international ties through its use of genetic samples curated in both domestic and foreign research collections. Inter-institutional collaborations will also be stimulated to aid in the computational challenges presented by genomic scale datasets. As such, this study provides research opportunities for undergraduates interested in learning how to apply bioinformatics and statistical programming to answer fundamental questions in ecology and evolutionary biology. The results of this study will be disseminated broadly within the United States in non-

technical and scientific literature. Additionally, this study will help resolve long-standing taxonomic confusion within the genus *Cranioleuca*, providing a clearer picture of South American biodiversity; a goal of both science and conservation.

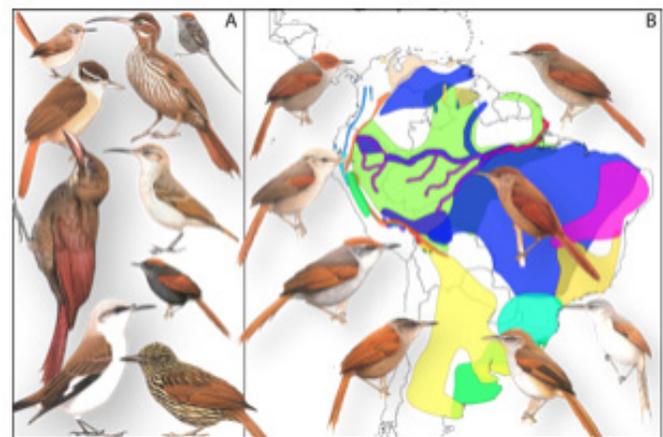


Figure 1. A) Exemplars of the phenotypic diversity of *Furnariidae* and B) distribution and representatives of the 25 species of *Cranioleuca*. Not to scale.

LSUMNS Spring Louisiana Birdathon Team Ready for another Shot at the Record!

Ryan Burner

The bird diversity in Louisiana is no match for that of many of the tropical hotspots where museum students conduct research, but the number of bird species that can be found here is among the highest anywhere north of Mexico. This is especially true during spring migration, when a large proportion of the migratory bird species of North America pass through Louisiana on their way to their breeding grounds further north. Spring is an exciting time for us at the Museum - planning for summer fieldwork is underway, some of our fellow graduate students are defending their dissertations, and we sneak away at every spare moment to search for migrant birds. Spring migration is also when we carry out our annual Louisiana Birdathon fundraiser, timed to take advantage of the peak of spring migration through the Gulf Coast.

After last year's team spotted 204 species in spite of logistical difficulties (i.e. they got stuck in the mud), this year we are going back out in an attempt to match, or even break, our 2010 record of 221 species for a single team Birdathon effort! After weeks of scouting and planning, a team of ornithology graduate students will scour southwestern Louisiana for 24 hours in an attempt to see or hear as many bird species as possible. With the right combination of effort, weather, and luck, we hope we can approach or even better

that record number this year.

In addition to raising public awareness of the wonders of Louisiana spring migration and satisfying our desire, not to mention competitive thirst, to cross the state from piney woods to coastal marshes in a single day, the event makes a much relied-upon contribution to our research. Whether dollar amount donations or amount-per-bird pledges, one hundred percent of the funds we raise with this annual event are used to support field and lab work conducted by ornithology graduate students at the Museum. This money is incredibly helpful for us in getting newly conceived research projects off the ground, or filling in in a pinch when grant funds run low. In the last year, museum graduate students in ornithology have used Birdathon funds to collect data in Borneo, Java, Bolivia, and Peru, to buy materials to sequence DNA from specimens housed in the museum and newly collected in the field, and to present their research at the International Ornithological Congress.

By the time you read this we'll either have bested our 2010 record or not - but we're sure we'll have had fun in the process. We hope you're all getting out doing some birding too! If you'd like to support graduate research through this event, here's how you can do it.



Left to right: **Andrés Cuervo, Sarah Hird, Matt Brady, Cesar Sanchez, Glenn Seeholzer, Dency Gawin, Ryan Burner, Vivien Chua, Michael Harvey, Clare Brown, Ryan Terrill, Caroline Duffie, Paul van Els.** Photo: Amy Shutt www.amyshutt.com

Donations

In addition to checks mailed directly to the Museum (make payable to LSU Foundation with Ornithological Student Support Fund written in the memo), you can also make online donations through the LSU Foundation website < www.lsufoundation.org/givetoscience >. Please fill out the form from the link. Click on the section entitled “*Click to choose a fund(s)*”. A window will open, and please scroll to the bottom and choose “*Other*”. It will ask you to list the fund name in the comments section of the main form, so please type in “**Ornithological Student Support Fund**” as a comment. Thanks!

MNS at LSU Day at the State Capitol

On April 7, 2014, graduate student **Valerie Derouen**, Director **Robb Brumfield** and Curator **Prosanta Chakrabarty** represented the LSUMNS at LSU Day in the Capital Building Rotunda.



Above: **Valerie Derouen**.
Below: **Prosanta Chakrabarty, Robb Brumfield, and Valerie Derouen**.



Above: **Robb Brumfield**.



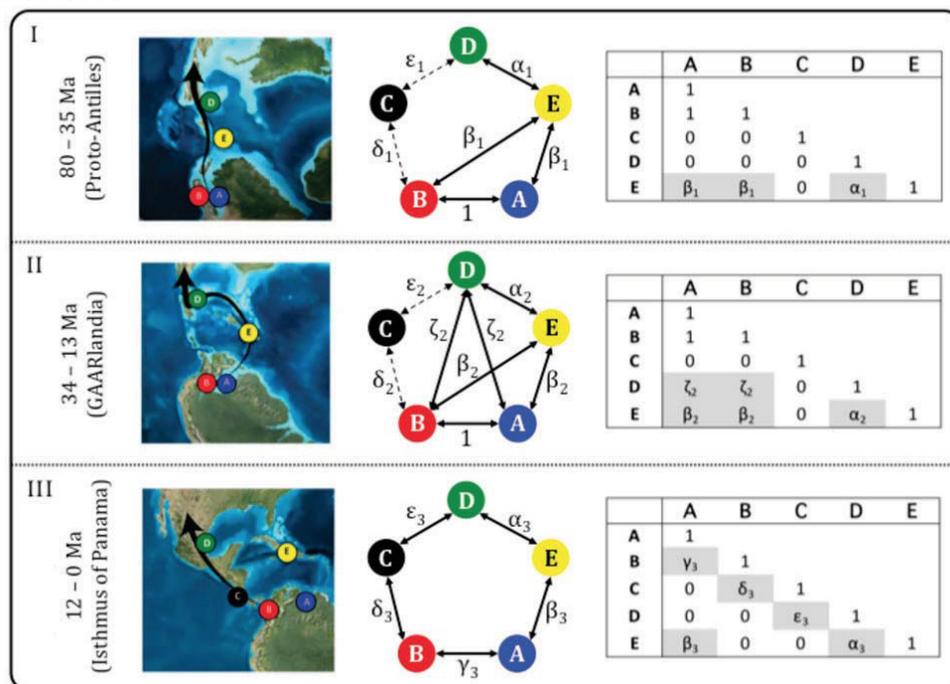
Collaborative Research: Not So Fast- historical Biogeography of Freshwater Fishes in Central America and The Greater Antilles

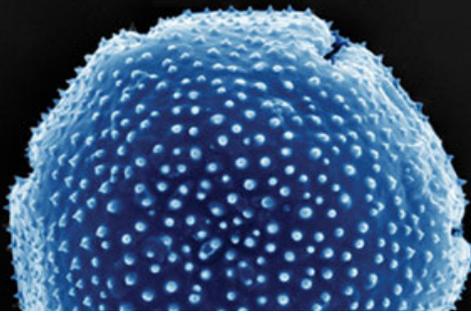
Prosanta Chakrabarty and James Albert from University of Louisiana Lafayette as co-PI, received a grant to continue their biogeographic research of freshwater fishes from the Northern Neotropics.

\$ 781,182 NSF DEB: Collaborative Research: Not so Fast - Historical biogeography of freshwater fishes in Central America and the Greater Antilles PC is PI (\$506,704 to LSU), co-PI James Albert (ULL), August 2014-2018

Geologically, the Central America/Greater Antilles region is one of the most complex areas in the world with extinct and current landbridges, drifting island chains and many moving parts over the last 70 million years. The 500+ species of freshwater fishes of this area can tell us about this regions complicated geological history because they are typically restricted to freshwater habitats on those moving landmasses (i.e., they could not move across areas unless they were physically connected). Thus, the history of these fishes can reveal the complex history of the islands and landmasses that currently make up the Central American landbridge and the Greater Antillean islands. This project will help researchers better understand the impact of the separation of the Caribbean Sea and the Pacific Ocean and the connection of North and South America by what is now Central America and potentially by earlier landbridges. Researchers will gain a better understanding of how major and dynamic geological changes can affect a biota both regionally and potentially globally.

In this study, researchers will collect specimens of the regions freshwater fishes in order to obtain DNA and morphological specimens to better understand the relationships of these species with one another and to date divergence times of lineages to better understand the timing of the major geological events of the region. Working with local Caribbean and Latin American colleagues as well as student members of their own labs, researchers will also determine the conservation status of these poorly understood and potentially threatened lineages. Thousands of museum specimens, next-generation genomic markers, and newly developed phylogenetic and biogeographic programs will be made available as the products of this work. Below is a photo showing the three major biogeographic hypotheses to be tested.





Sophie Warny Recognized by LSU Alumni Association



Sophie Warny, AASP Professor in CENEX, has been awarded the 2014 LSU Alumni Association Rising Faculty Research Award. This award recognizes faculty at the rank of assistant professor who have outstanding records of scholarship and published research. Congratulations Dr. Warny!

In Memoriam: Margaret “Peggy” Sims



A native and resident of Baton Rouge peacefully passed away on April 19, 2014 at the age of 72. She was preceded in death by her parents, Dr. James Robert Godfrey and Nell Brabham Godfrey. She is survived by her sister Patricia A. Godfrey; her two sons Robert L. Sims Jr. and James W. Sims; her daughter-in-law Patrice B. Sims, five granddaughters and one great-granddaughter. She was an ardent gardener and lover of nature. Her time spent employed at the LSU Museum of Natural Science was one of the highlights of her life. In lieu of flowers, the family requests donations be sent to the Louisiana State University Museum of Natural Science. You can make donations through the LSU Foundation website: www.lsufoundation.org/givetoscience. Click ‘designations’. Choose ‘Museum of Natural Science and Research Support Fund’. In tribute information section of main page type ‘in memory of **Peggy Sims**’.
Published in The Advocate from Apr. 22 to Apr. 25, 2014



Making a Big Splash... ...with Louisiana Fishes

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Email your material to swarny@lsu.edu or mail to:

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