Fall 2024 - 2025 Newsletter



### AN EXPEDITION TO THE PURUS RIVER IN CENTRAL **BRAZILIAN AMAZONIA**



Dr. Edson Abreu and biology student Aramide Oladiran heading to their field site.

The Amazon Forest (locally known as Amazonia) is the largest and one of the most diverse tropical forests on the planet. Still, much of the Amazonian biodiversity remains to be discovered. In June 2024, 14 researchers, students and nature enthusiasts packed their fieldwork gear and embarked on a 75-foot boat from Manaus (the capital of the state of Amazonas in Brazil) towards the wilderness of the Amazon jungle.

The group included ASU biology professor, Dr. Edson Abreu, and ASU undergraduate

student, Aramide Oladiran, and was led by Dr. Alexandre Percequillo, a professor from the University of São Paulo (USP) in São Paulo, Brazil. In addition, the expedition team included scientists from three other Brazilian universities and two research institutes. This field expedition was part of a larger research project, coordinated by Percequillo in collaboration with Abreu, that aims to survey unexplored remote sites in the Brazilian Amazonia within the next few years.

See AMAZONIA, Page 2

### NEW COLLECTIONS MANAGER: WELCOME HOME



The curators and student workers of the ASNHC welcomed Rose Wilhoyt as the fifth collections manager in January 2024. Joining the ASNHC was a homecoming for Wilhoyt as she had previously volunteered in the collections under the guidance of managers Marcy Revelez and Dianna Krejsa when she was an undergraduate biology student. During her time as a student worker, when she wasn't busy with classes or Tri-Beta (our biology honor society), she focused her late hours on georeferencing and data entry for the collections.

In her senior year, she worked diligently in the dark recesses of the Cavness Building to manage the dermestid beetle colony and the flow of specimens in and out of this important area. She also focused her time and energy on organization, especially in the Collection of Reptiles and Amphibians and the Vivarium.

However, Wilhoyt was not just an asset behind the scenes.

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#### AMAZONIA

Continued from Page 1



Purus expedition research team.

"The overall goal of this project," Perquillo said, "is to discover and describe new mammal species and investigate historical biogeographic processes responsible for generating the impressive diversity of Neotropical mammals, particularly in three rodent families, represented by squirrels, rats and mice, and spiny tree rats."

The Purus River, the target site of the 2024 expedition, is one of the main tributaries of the southern bank of the Solimões-Amazonas riverine system. Over about a month, the team of researchers documented and collected specimens of mammals (mainly rodents, marsupials and bats) in four different locations along the Purus River, as depicted in the map shown.

The team collected a total of 315 mammal specimens, representing about 65 different species. The most diverse group were the bats, both in number of specimens captured (nearly 200) and species so far identified (38 species). Besides the specimens, which were preserved either as study skins and skeletons or whole-body fluid specimens, several types of samples from the animals were collected, including tissue samples for genetic analyses, digestive tract swabs for virus screening and bacterial microbiome analyses, and ecto- and endoparasites. Additionally, cell cultures for about 100 individuals were made for chromosomal analyses.

The intensive field effort, using different

kinds of mammal traps and diurnal and nocturnal hunting, allowed the collection of elusive species and likely species new to science. The highlights of this expedition include the collection of three specimens of the elusive giant tree-rat (*Toromys grandis*). This species was first reported near the Purus River in 2018 after a field expedition led by Abreu. Besides reporting the collection of a new individual of the giant tree-rat after a 60-year interval when no new specimen was reported, Abreu and his colleagues published new information on the distribution, morphology and natural history of this mysterious rodent.

"We are now excited about the possibilities that these new individuals bring to investigate other aspects of the giant tree-rat biology and evolutionary history," Abreu said.

The Purus team is also excited about the possibility of documenting the presence of the Ronald's opossum (*Monodelphis ronaldi*) in Brazil for the first time. Four specimens morphologically resembling this species were collected, and the researchers will be working on DNA analyses to confirm the identity of the collected specimens.

"This expedition was nothing but incredible," Oladiran said. "Not only was I able to connect with the local community and experience the rich culture and dishes, but I also gained a new perspective on the value of fieldwork in research. This



This map shows the sampling sites along the Purus River in the Brazilian Amazonia.

experience deepened my appreciation for the importance of hands-on scientific exploration and learning. I returned with countless stories and memories that I will forever carry with me and that have enriched my current research and inspired my passion for fieldwork."

The Purus expedition was supported by a five-year thematic grant provided by the São Paulo Research Foundation to Percequillo. Abreu and Oladiran's trip was also supported by the ASU Department of Biology and College of Science and Engineering.



Aramide pinning specimens to dry.

#### WELCOME HOME

#### **Continued from Page 1**

When the ASNHC partnered with the San Angelo Museum of Fine Arts, she interacted – in full costume – with patrons and visitors at such events as the community celebration of Dia de Los Muertos and the grand opening of our joint exhibit, "West Texas Wunderkammer."

Although Wilhoyt's graduation from ASU took her away from formal collections, her passion for natural history collections never waned. At home, she continued to press plants and maintain her own cabinet of curiosities, including shells, stones, insects and bits of bone, as a testament to her joint interests in nature and natural history. Although she never expected to return to the ASNHC, fate had other ideas. When the previous collections manager, Makayla Easley, departed for a faculty position, Wilhoyt's dream job was vacant, and her chance to rejoin natural history collections and the ASNHC lay before her.

As collections manager, Wilhoyt has hit the ground running. Whether it be reorganizing our skeletal storage room, managing student workers, or participating in online courses and workshops, she is always busily working to improve the ASNHC. After a long hiatus, specimen-prep Fridays have returned, and the prep area on these Fridays is

#### JUST IN CASE: THE "WOOL ROOM'S" MAKEOVER

The mammals and birds skeletal storage room, also historically referred to as the "Wool Room," received a well-deserved makeover this year in preparation to receive a gracious donation from Vicky (Mingna) Zhuang, the biodiversity collections manager for the University of Texas at El Paso. She was organizing UTEP's own makeover and needed a home for their older specimen cases six of which ASU's Dr. Robert Dowler thoughtfully reserved, just in case we could find room for them. Thus, the Wool Room makeover became one of the first projects in the Mammals Collection for our new curator of mammals and collections manager. Dr. Edson Abreu and Rose Wilhoyt partnered up with ASU facilities staff to demolish wooden shelves, move specimen cases from the Tri-Beta office, and install and secure metal shelving for mammal fluid specimens. The two worked through the spring semester to dust, wipe, organize and inventory our oversized mammal skeleton holdings, and the six cases were transported to their new home during Spring Break. While it will be an ongoing process, we hope to conclude installation of our bovid skulls into these cases by spring 2025.





abuzz with conversation, fur, feathers and scales, as well as the familiar scents of animal carcasses on their way to being scientific specimens. Inspired by one of her online courses, Wilhoyt has set her sights on completing the digital imaging of the ASNHC holdings within the next five years, which will make our collections even more valuable to the wider scientific community. We are excited to have Wilhoyt serve as collections manager and look forward to growing and improving the collections under her supervision for years to come. Welcome home Rose!

Before



After

### SPRING BIOBLITZ

One event we all look forward to is our BioBlitz at a local ranch. As winter gives way to spring, students, staff and faculty anticipate the opportunity to get outside and be reminded why each has chosen – or is choosing – to pursue a career in biology. In spring 2024, our BioBlitz was held at Knickerbocker Ranch just southwest of San Angelo. Despite the cool temperatures in late March, students eagerly looked for every plant and animal they could find. Altogether, BioBlitz participants documented nearly 120 species during the event. Observations of plant species were the most abundant, and Tri-Beta's co-sponsor, Carla Ebeling, led the day's efforts with 47 species identified! A special thanks to the Tri-Beta officers for helping organize the event, and to the owners of Knickerbocker Ranch for allowing us the opportunity to visit.

# **MUSEUM COLLABORATION** FOR RODENT RESEARCH AT FRANKLIN MOUNTAINS STATE PARK

Personnel from the ASNHC, Chicago State University and The Field Museum in Chicago, and the Kansas University Biodiversity Institute and Natural History Museum in Kansas collaborated on a field project to survey rodents near El Paso in June 2024. Dr. Robert Dowler joined former ASU students Adam Ferguson and Molly McDonough, former ASNHC Collections Manager Dianna Krejsa, and KU graduate students Ben Wiens and Danny Ibanez to sample rodents at high-elevation sites in Franklin Mountains State Park. This area was last surveyed in the 1970s, and the rodent specimens from this recent project, deposited in the mammal collections of the ASNHC and The Field Museum, will allow the comparison of rodent communities almost 50 years apart in time. One species collected, the northern rock deermouse, was especially interesting in that in Texas, it only occurs on "sky island" mountain tops in the Trans-Pecos region.



#### SUMMER HAPPENINGS: SAMFA TOUR

Between the spring and fall semesters, the typical chatter of college students and full classrooms is absent, replaced by the occasional footfall of the lingering professor and perhaps the quiet murmuring of our new collections manager. However, this summer, the halls of the Cavness Building were visited by a lively group. The San Angelo Museum of Fine Arts hosted its annual Art of Nature Summer Camp, comprising 25 young biologists led by summer camp staff. Dr. Carlos Maya-Lastra hosted the Herbarium and Greenhouse portions of the tour, and Rose Wilhoyt guided the group through the Mammals, Birds, and Reptiles and Amphibians collections. All the while, this curious and well-behaved lot asked plenty of questions and, hopefully, took with them plenty of inspiration for their art projects!





#### AROUND THE COLLECTIONS

Following the annual meeting of the Southwestern Association of Naturalists in Aguascalientes, Mexico, in April, Dr. Robert Dowler returned with 19 ASNHC specimens collected during a 2007 ASU biology research expedition in Mexico. The specimens were housed at CIIDIR Unidad Durango, Instituto Politécnico Nacional, awaiting someone to import them to the U.S. In the summer, we kicked off specimen preps again. We were happy to have avid

collector Richard Brown join us for a Herp Prep Day so he could get a peek at the next steps following the collection of the many specimens he contributes to the ASNHC. New and seasoned student volunteers have been tackling backlogged material to inventory, osteoscribe, label and install in the Mammals and Birds collections. In Herbarium news, Dr. Maya-Lastra and Katie Pearson of Symbiota published our Herbarium database to GBIF, a milestone





that allows researchers to search our specimens for their projects – and allows ASU to contribute to scientific efforts. Meanwhile, Rose Wilhoyt is working steadily with student workers on some exciting projects: to fully transcribe our Symbiota database, to image and transcribe nearly 600 cataloged specimens, and to create a teaching collection, or Synoptic Collection, of plant specimens found in the Concho Valley!

### MAYER MUSEUM EXHIBIT - THE WILDS OF AFRICA

The ASNHC curators worked with the staff of the ASU Mayer Museum to design and build the exhibit, "Wild Encounters: Animals of East Africa," which filled the main exhibit hall from January - August 2024. We included a variety of ASNHC taxidermies and skeletal materials, plus replicas of some East-African fossil hominids. We added some cultural elements by including information about some of the products that originated in this region, like coffee and the Mancala game.



### **PRESENTATIONS AT CONFERENCES**

During recent semesters, our ASNHC curators, collection manager and students have been busy learning and presenting research results at multiple events across four different countries, both in person and virtually. In October 2023, Dr. Loren Ammerman and four graduate students attended the North American Symposium on Bat Research (NASBR) in Winnipeg, Canada, where they gave two presentations.

In January 2024, Ammerman and graduate student Flor Calderon gave a presentation at an "Agave and Bats" meeting in Alpine organized by Bat Conservation International. They also toured greenhouses where agave is grown for restoration efforts.

In February 2024, graduate students Calderon and Ashley Loehn participated in the Texas Society of Mammalogists (TSM) conference in Junction, with Loehn winning a presentation award for her undergraduate research.

In April 2024, a big representation from the ASNHC, including Drs. Robert Dowler, Ben Skipper, Mike Dixon and Ammerman, as well as undergraduate student Halle Summers, attended the Southwestern Association of Naturalists (SWAN) meeting in Aguascalientes, Mexico, where they gave three presentations.

In June 2024, Dr. Carlos Maya-Lastra and undergraduate student Emma Rust attended Botany 2024 in Grand Rapids, Mich., presenting a phylogenomic exploration of *Cnidoscolus* and attending the Supporting Inclusive and Sustainable Research Infrastructure for Systematics (SISRIS) Workshop.

In July 2024, Maya-Lastra participated at the TORCH annual meeting in Norman, Okla., presenting the current status of the ASU Herbarium and exploring the benefits and challenges of having a student-driven collection.





Tuttle at the North American Symposium on Bat Research in Canada.

### **COLLECTIONS BY THE NUMBERS:** 2024 SPECIMEN TOTALS

Herbarium: 58,715 Mammals: 21,481 **Birds:** 3,642 **Reptiles and Amphibians:** 15,467 **Tissues:** 35,221 **Outgoing loans:** 22 Volunteer hours: 281 Visitors: 259

#### Visiting scholars (3): Maria de Jesús Méndez Aguilar (Universidad Autónoma de Yucatán), Travis LaDuc (University of Texas at Austin), Gary Spicer

#### **PUBLICATIONS - STUDENTS AND FACULTY**

R.D. Stevens, and C.C. Rega-Brodsky. 2023. Examination Babesia spp. in skunks from selected states in the United the act: Incipient speciation at the southern limit of of Plains Spotted Skunk (*Spilogale interrupta*) burrow systems. Southeastern Naturalist 22(3): 352-363. <u>doi.org/10.1656/058.022.0306</u>

Boeger, W.A., M.P. Valim, H. Zaher, et al. 2024. Catálogo L.P. Hancock, and E.J. Edwards. 2024. Predicting Taxonômico da Fauna do Brasil: Setting the baseline knowledge on the animal diversity in Brazil. Zoologia 41: learning. New Phytologist 242: 1029-1042. e24005. doi.org/10.1590/S1984-4689.v41.e24005 doi.org/10.1111/nph.19488

Fitzgerald, K.V. and L.K. Ammerman. 2024. Cave and provide important ecosystem services. Journal of Mammalogy 105(6): gyae102. doi.org/10.1093/jmammal/gyae102

Garrett, K.B., J. Brown, M. Gabriel, R. Dowler, J.C.

#### **PRESENTATIONS - STUDENTS AND FACULTY**

Mexico, North American Symposium on Bat Research, Winnipeg, Canada, October 2023, and Texas Society of Mammalogists 2024 by **Flor Caderón**.

Anderson, M., and B.R. Skipper. 2024. Song dialects sky islands of New Mexico. Annual meeting of the Southwestern Association of Naturalists, Aguascalientes,<br/>Mexico, and annual meeting of the Texas Academy of<br/>Science, Odessa, Texas.Fant, M. and L. Fohn. 2024. Exploring the effects<br/>of artificial sweeteners on stem cells. Beta Beta Beta<br/>National Biological Honor Society South Central<br/>Regional Convention - Poster Presentation, Cedar Hill,

Bautista, J. and E. Crabill. 2024. The Effect of Fructose1,6-Bisphosphatases in Autophagy Upregulation. BetaBeta Beta National Biological Honor Society SouthCentral Regional Convention - Poster Presentation,Cedar Hill, Texas, and 2024 Great Plains Honors CouncilHawkins, H. and L. Fohn. 2024. A high-cholesterol dietin Drosophila melanogaster impacts the rate at whichthe cephalic furrow undergoes morphogenesis. OralPresentation. Annual meeting of the Texas Academy ofCodersa. Texas.

Bell, C. and L. Fohn. 2024. Detecting Lymphangiogenesis in response to atherosclerosis in Danio rerio. Beta Beta Beta National Biological Honor Society South Central Regional Convention - Poster Presentation, Cedar Hill, Texas. 3rd Place Poster, Acorn Session.

#### **FACULTY/STAFF GRANTS**

**Loren Ammerman** – Summarizing Population Trends and Foraging Behavior of Mexican Long-nosed bats (*Leptonycteris nivalis*) in Emory Cave (Texas Comptroller of Public Accounts Natural Resources Program, \$121,655, 2023-2025).

Carlos Maya-Lastra – Establishment of genome

#### **STUDENT GRANTS**

Ashley Loehn, Texas Academy of Science, 2024 ResearchThe following graduate students were awarded ASUGrant, Developing a protocol for detecting LeptonycterisGraduate Research Fellowships:nivalis at Emory cave using airborne eDNA. Advisor –Hanneh Duhon

Christian Bell – Beta Beta Beta Biological Honor Society Research Grant 2023-2024, Detecting Lymphangiogenesis in Response to Atherosclerosis in *Danio rerio*. Advisor – poppy-mallow sites. Dr. Laurel Fohn \_\_\_\_\_\_ Brianna Douglas \_\_\_\_\_

James Bautista – Beta Beta Beta Biological Honor Society Research Grant 2023-2024, The effect of fructose-1,6-bisphosphatases in autophagy upregulation. Advisor Faculty-Mentored Research Grants: 1,6-bisphosphatases in autophagy upregulation. Advisor – Dr. Emerson Crabill

doi.org/10.1051/parasite/2024043

Gilman, I.S., K. Hevduk, C. A. Mava-Lastra,

Loehn, A.E., D.W. Sparks, and E.W. Valdez. 2024. Diet of *Myotis ciliolabrum* from six sites in the southwestern United States. Western North American Naturalist 81:

Maya-Lastra C. A., P.W. Sweeney, D.A.R. Eaton, C. Torrez V., Maldonado, M.I. Ore-Rengifo, M. Arakaki,

Odessa, Texas.

\$14,990)

Edson Abreu – BRC-BIO Marajó: the origin and

Place Poster, Serpent Session.

**Rust, E.** and **C. Maya-Lastra**. 2024. Phylogenomic exploration of the *Cnidoscolus angustidens-maculatus* species complex. Poster presentation at Botany 2024, Grand Rapids, Michigan.

Hernandez, A. and B.R. Skipper. 2024. Columella morphology in Mississippi Kites (*Ictinia mississippiensis*) Annual meeting of the Texas Academy of Science,

**Carlos Maya-Lastra** – Hydroponics Systems: an Improved Hands-On Plant Experience for General Botany (Faculty Development Mini-Grant, \$2,500).

Hannah Duhon – Survey of Baiomys taylori and Chaetodipus hispidus for Brazospox Virus Prevalence.

Alix Kosmala – Comparative soil analysis at Texas

Brianna Douglas – Diet of Bewick's wren (*Thryomanes bewickii*) nestlings and adults.

Christian Bell – Detecting lymphangiogenesis in response to atherosclerosis in Danio rerio.

Benson, D.J., J.C. Perkins, K.P. Jefferson, R.C. Dowler, Perkins, D. Krejsa, and M.J. Yabsley. 2024. Diversity of M.J. Donoghue, and E.J. Edwards. 2024. Caught in *Viburnum* in the central Andes. Systematic Biology 73(4): 629-643. <u>doi.org/10.1093/sysbio/syae023</u>

> Méndez-Aguilar, M. de I., P.I. Montañez-Escalante, and C.A. Maya-Lastra. 2024. Maya traditional knowledge of Cnidoscolus spp. in the Yucatán Peninsula. Journal of Ethnobiology 44(3): 305-319. <u>doi.org/10.1177/02780771241261226</u>

Pavan, S.E., E.F. Abreu, P.Y. Sánchez-Vendizú et al. 2024. A hint on the unknown diversity of eastern Andes: high endemicity and new species of mammals revealed through DNA barcoding. Systematics and Biodiversity 21(1): 2302196. <u>doi.org/10.1080/14772000.2024.2302196</u>

Ammerman, L.K., A. Loehn, F. Calderon, and M.T.<br/>Dixon. 2024. A test of automated tracking software<br/>(ThruTracker) using 14 years of cave emergence data.Buchanan, A. and L. Fohn. 2024. The effects of essential<br/>oils on planaria regeneration. Beta Beta Beta National<br/>Biological Honor Society South Central RegionalLoehn, A.E., D.W. Sparks, and E.W. Valdez. 2024. Diet<br/>of *Myotis ciliolabrum* from six sites in the southwestern<br/>United States. Annual meeting of Texas Society of<br/>Mammalogists., Junction, Texas. William B. Davis Award for best oral presentation in classical mammalogy at the organismal level by a graduate student.

> McCoy, W. M. and L K. Ammerman. 2023. Molecular systematics of Sauromys and Platymops within Molossidae. North American Symposium on Bat Research, Winnipeg, Canada.

Moore, M. and L. Fohn. 2024. Live cell imaging of nicotine-induced polyspermy in sea urchins. Poster Presentation. Annual meeting of the Texas Academy Biological Honor Society South Central Regional Hawkins, H. and L. Fohn. 2024. A high-cholesterol diet Convention - Poster Presentation, Cedar Hill, Texas.

> Rodriguez, A. and E. Crabill. 2024. Host-pathogen interactions: Determining the role of the *Coxiella* induction. American Society for Rickettsiology Meeting, Colonial Williamsburg, Virginia.

> Summers, H. and L.K. Ammerman. 2024. DNA States. Poster presentation at Southwestern Association of Naturalists, Aguascalientes, Mexico.

fluvial island (National Science Foundation, \$463,000,

Edson Abreu – Taxonomic revision of South American tree squirrels of the genus *Guerlinguetus* Gray, 1821 Program, \$14,993, 2024-2025).

McKenna Fant – Exploring the effects of artificial sugar on stem cells.

Hailey Hawkins – A high-cholesterol diet in Drosophila melanogaster impacts the rate at which the cephalic furrow undergoes morphogenesis.

Rian Hernandez – Quantifying autophagic flux with Halo-Tag in HeLa cells expressing cinF.

**Mya Moore** – Efficiency of incubation technique to achieve live cell imaging of the actin cytoskeleton and fertilization in nicotine-induced polyspermy in sea

Karen Soto Castro – The effect of CinF from Coxiella burnetii on hot cell autophagy. 7

### THE ASNHC MISSION STATEMENT

#### The Mission of the Angelo State Natural History Collections is to:

- Provide a permanent, well-maintained, active reference collection of the world with an emphasis on the flora and fauna of the Concho Valley and surrounding areas.
- **THANK YOU**

Thank you to all who support the ASNHC in all the ways that you do! Your support is vital to our growth and maintenance.

Special thanks to the donors who so generously contributed to our efforts: Adam Ferguson, Adina Hernandez, Anthony Multer, Austin Osmanski, Ben Skipper, Bethany Guajardo, Caleb Vosburg, Christian Herrera, Cody

- Provide a learning laboratory for ASU students to facilitate and encourage research and education.
  - Promote awareness, understanding and appreciation of global biodiversity.
- Contribute specimens and data for study by research scientists around the world.

•

Edwards, Cody Webb, Dale Werner & Darcy Maloney, Dawn Rodriguez, Dianna Krejsa, Drew Sykes, Fazlur Rahman, James Fulgham, Kimberly Decker, Laurel Fohn, Lisa Barrow, Michael Dixon, Morris Reese, Robert Dowler, Sam Spooner, Vicky (Mingna) Zhuang and Vincent Mangano.

Thanks also to the student workers and volunteers who help us keep things

running smoothly: Adina Hernandez, Alexandra Shepherd, Andrea Burt, Aramide Oladiran, Ashley Allison, Ashley Loehn, Brady Huff, Donavan Armendariz, Dustin Sanchez, Gabriela Linsalata, Halle Summers, Kaleigh Pierce, Karen De Soto Castro, Katelynn Graves, Liana Gonzalez, Lily Blaylock, Lorien Garcia, Ray Heiser, Reyna Gonzalez, Skylar Harlan and Zyrene Calingo.

## DONATIONS MAKE A **DIFFERENCE**

When you donate to the ASNHC or participate in our fundraising events, you contribute directly to our endowment named in honor of former ASU biology professor and curator of birds, Dr. Terry C. Maxwell. The interest from this fund helps grow and maintain our collections and fund research. The growth of this endowment could provide the means to expand the collections with new specimen cases, to update technology used for curation of specimens, and to upgrade our database management system. Funding goals currently include digital imaging stations, backup generators to ensure power for the Frozen Tissues Collection, and a thermal printer to print data tags for specimens stored in ethanol.

If you are still interested in original

artwork by Dr. Maxwell, please visit angelo.edu/maxwell to view drawings available for a donation of \$100 or more. In addition, please let us know if you have any of his originals at home that you would be interested in scanning or allowing us to scan to provide an archival digital record of his work.

### HATS AND T-SHIRTS STILL AVAILABLE



If you missed getting your ASNHC logo shirt or hat last year, we still have some available! For a \$20 donation or more to the Terry C. Maxwell Endowment, you can select an ASNHC baseball cap or an ASNHC T-shirt as a thank you gift.

Please consider making a donation to the endowment: angelo.edu/maxwell