

Program updated 7/24/2022

# Invertebrates in Education and Conservation Conference 2022



**Tuesday, July 26**

9:00 a.m. - 4:00 p.m. TITAG Meeting – Agave Ballroom

1:00 p.m. - 4:00 p.m. Registration – Presidio Desk

4:00 p.m. - 6:00 p.m. Ice Breaker – Presidio III,IV,V

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**Green Hills  
Butterfly Ranch**



**Wednesday, July 27**

6:30am – 8:30am Registration – Presidio Desk

1:30pm – 5:30pm Registration – Presidio Desk

FIELD TRIPS – Pre-registration required. All field trips should meet at Presidio Registration Desk

**Bug Blitz: Saguaro National Park (13 Participants)** – Luke Hetherington, Saguaro National Park **7:00am-4:00pm**

Are you looking to boost your iNaturalist observations, rather than collect specimens? Do you like exploring amazing canyons where Saguaro cacti and Sycamore trees grow side by side?

Well then this is the field trip for you!

Take a trip to Saguaro National Park, where we will be granted access to a secluded area of the Rincon Mountains where perennial waters fill tinajas and support a wide variety of wild creatures in a very unique habitat. Make sure to bring close toed shoes, sun protection, in addition to lots of snacks and water for this canyon adventure. After exploring the canyon we will visit the Visitor Center and drive around the Cactus Forest Loop, of Saguaro NP (time permitting). Space is limited to 13 participants, and this is a no collecting field trip.

**Border Bugs 2022 (12 Participants) – Jim Melli, San Diego Natural History Museum 7:15am-4:00pm**

We will explore the beautiful Pajarito Wilderness just north of the border. The proximity to the border and variety of habitats ranging from Madrean woodlands, desert grasslands, streams, ponds, and rocky hillsides bristling with ocotillo and agave ensure that something groovy will show up. Critters, more common in Mexico, sometimes steal across the border into this area. If we're lucky, we may encounter a brown vine snake or other Mexican specialties. For sure we will find some cool bugs. Full day field trip. This trip is to enjoy the wonders of this spectacular area, so lets leave the bugs behind.

**PEPSIS AND POETRY (24 Participants) – Zack Lemann, Audubon Insectarium NOLA 7:30am-4:00pm**

Environments hot and xeric | Need not be things esoteric  
Come have some fun | In the desert sun  
And your joy will be atmospheric!

This land has a special aura | And neat bugs are in it for ya  
Come drive around | Where arthropods abound  
It's the place known as Sonora

The limerick as lure. But really, who needs it when you have the habitat variety, monsoon-generated activity, and incredible insect and spider diversity of southeast Arizona? This field trip will give participants a chance to observe and responsibly collect bugs both common and rarely encountered, many of which are so beautiful they'll take your breath away. We'll discuss natural history, ecology, and the never-ending debate of chocolate versus vanilla as we meander through the Santa Rita Mountains.

**Mt Lemmon Sampler: Come and explore the many habitats that make up a Madrean Sky Island (20 Participants) - Tony Palmer, Tumacacori National Historical Park 7:45am-4:00pm**

In this field trip you will ascend Mt Lemmon, stopping for a few minutes in each of the habitats to see what invertebrates we can find.

Habitats will include Sonoran Desert, Semi-Desert Grasslands, Oak Woodland and Chaparral, Pine-Oak Woodland, Ponderosa Pine Forest, and Mixed Conifer Forests. Come prepared for everything as the temperatures atop Mt Lemmon will be ~20-30 degrees cooler than those on the desert floor. Sturdy close toed shoes, sun protection, and a light windbreaker or rain jacket are recommended. Bring plenty of water and come ready to explore.

**Tucson Botanical Gardens (12 Participants) – Led by the Botanical Garden 8:30am- 10:30am**

Enjoy Tucson’s midtown oasis during monsoon season! A brief overview of the Gardens’ history will be followed by a tour of the Gardens led by the Horticulture Manager. Topics during the tour will include an overview of the Gardens’ integrated pest management program, bee box partnership, and soil formation. After the tour of the grounds, the Curator of the Tropical Conservatory will discuss the butterfly program, including a visit inside the greenhouse to see orchids and other tropical plants (butterflies are not present in the summer months). Following the tour, participants can then self-guide to areas of interest, and consider visiting the café and gift shop. No collecting is allowed on this field trip.

**EVENING EVENTS**

5:30pm – 9:00pm Welcome, Keynote Presentation, and Reception - Presidio III,IV,V

IECC 2022 Keynote Speakers, “The Bug Chicks”, Kristie Reddick and Jessica Honaker.

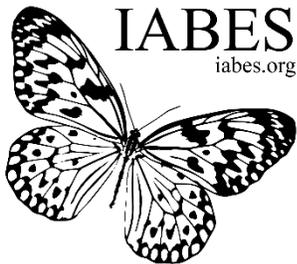
Kristie Reddick and Jessica Honaker are “The Bug Chicks”: entomologists, educators and sci-comm professionals who teach about the fascinating world of arthropods. Through videos, digital media and in-person teaching, they inspire people to open their minds and learn about these often-maligned animals. Their signature style blends science education with social-emotional learning and uses bugs as a vehicle to talk about concepts like recognizing implicit biases, prejudice, growth-mindset and empowerment. They’ve worked all over the world and their latest project, the award-winning curriculum DIFFERENT, blends STEM and SEL to create an evidence-based, positive mindset shift in students.

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#### **Thursday, July 28**

7:00am - 4:00pm Silent Auction

7:30am – 4:30pm Please visit our vendors

7:00am - 4:00pm Registration -- Registration may close during paper sessions and lunch. - Presidio III,IV,V

#### **PAPER SESSIONS**

8:00am Welcome and Announcements - Presidio III,IV,V

8:10am – 9:40am Insect Monitoring: From Evergreen to Everglades

8:10am - 8:30am Jaret Daniels - Florida Museum of Natural History

#### **Drones, Monarchs, and Milkweed: Using AI and Deep Learning to Monitor Roadsides**

Florida Department of Transportation-maintained roadsides were found to harbor sizeable populations of two focal milkweeds important for the spring re-migration into the Deep South. Using this past work as a baseline, we conducted a proof-of-concept project to test the effectiveness of using drones and AI/deep learning to help identify milkweed plant populations. The results could potentially be used to help track plant populations over time and evaluate if they are increasing, decreasing, or stable in support of the Nationwide Monarch CCAA. It also has potential applicability for other managed landscapes.

8:30am – 8:50am Erin Mills – Houston Botanic Garden

**Golf to Garden**

An underutilized golf course is converted into a Botanic garden and what once was a monoculture of non-native turf grass is allowed to re-naturalize and flourish with life. This creates new habitat and new opportunities for arthropods of all kinds. It also creates opportunities for citizen science! We'll explore the plants that have moved in and the pollinators, herbivores, and predators that are taking advantage.

8:50am – 9:10am Logan Crees - USDA/ARS Invasive Plant Research Laboratory

**Insect Bio-controls in the Florida Everglades**

Using insect biological control agents for invasive weeds is an ever-growing field with new insect species being approved for release every year. In Florida, the vast expanse of the Everglades ecosystem is the setting for many of these insect and plant interactions. From floating water hyacinth to vining old world climbing fern, and impenetrable forests of Melaleuca, biological control insects play an important role in the conservation of Florida's "River of Grass". I'll cover the selection, approval, mass rearing, release, and outcomes of several decades of biological control implementation in the pursuit to help conserve and restore North America's largest wetland ecosystem from invasive plants.

9:10am-9:20am Hannah Atsma - University of Florida (Short)

**Vertebrate Surveys Through Mosquito Blood Meal-Derived DNA at the DeLuca Preserve**

Biodiversity surveys are essential to understanding the occurrence of endangered and invasive species. Surveys can be problematic due to cost, time, difficulty traversing habitats, and challenges associated with species that are cryptic or in low numbers. Previous studies proposed using DNA fragments in the environment to detect vertebrate diversity. Similarly, we propose using mosquitos (known to feed from all terrestrial vertebrate classes) and their blood meals as a source for vertebrate DNA to detect the biodiversity in the flatwood forest system of central Florida at the Deluca Preserve to explore mosquito blood meals as a novel method for vertebrate sampling.

9:20am - 9:30am Rachel Martinez – Green Hills Butterfly Ranch

**Butterfly farming from a Mayan girl's perspective**

One girl's story of establishing a butterfly farm from scratch in a remote Mayan community.

9:30am - 9:40am Erin Sullivan – Woodland Park Zoo

**Pollinators for All: Building Inclusive Pollinator Gardens**

Woodland Park Zoo has historically had a butterfly garden but in 2019 we decided to make a more inclusive garden which would allow people who do not come on grounds to the zoo to learn a little more about pollinator gardens. At the same time, we started working on a pollinator garden on the Capital Campus in Olympia, WA. We will share the story of the design of these new gardens.

9:40am-10:00am Announcements and Break

10:00am – 12:00pm Largely Lepidoptera Conservation (With Special Guests!) - Presidio III,IV,V

10:00 am – 10:20am Tim Becker - ZooAmerica North American Wildlife Park & Erika McKinney - Pennsylvania Department of Military and Veterans Affairs.

**A Regal Fritillary Story 2011 – 2022; An Update on the Partnership between ZooAmerica North American Wildlife Park and Fort Indiantown Gap Military Reservation**

Fort Indiantown Gap Military Reservation (FIGMR) has the last population of regal fritillaries remaining east of Indiana and is the last population of the eastern subspecies (*Argynnis idalia idalia*). Our presentation discusses the current status of *A. idalia idalia* at FIGMR, and results of the partnership with ZooAmerica to rear regal fritillaries for reintroduction. A summary of egg production and fertility in our rearing lab will be presented. Also outlined are improvements to our overwintering protocol, the results of studies on the effect of violet species on larva growth, and prevalence of *Wolbachia* within the FIGMR population.

10:20am - 10:40am Maddie Ferner and Virginia Tilden - Pennsylvania Department of Military and Veterans Affairs

**The 3 Rs of Regal Fritillary Conservation: Rear, Reintroduce, and React: The Unexpected Challenges of Protecting an Increasingly Rare Butterfly Species**

Remaining as only a single population at Fort Indiantown Gap National Guard Training Center (FIGNGTC), the eastern regal fritillary (*Argynnis idalia idalia*) is a grassland endemic butterfly with a unique biology, life history, and set of demands for suitable habitat. Biologists at FIGNGTC have worked for decades to navigate these challenges for the benefit of the species and have made measurable strides in doing so. As it often goes, these successes have revealed additional obstacles- developing and managing reintroduction sites and partnerships, outsourcing monitoring schemes, and doing it all with a species listing on the horizon. This talk will highlight these unpredicted challenges and their in-motion solutions.

10:40am – 11:00am Kayla Garcia - Saint Louis Zoo

**Past, Present and Future of American Burying Beetles (*Nicrophorus americanus*) at the Saint Louis Zoo**

We've all heard the old saying that "the only constant in life is change." And, we've all probably been reminded that "things change," or advised to "embrace the change." In 2019, things changed for the Center for American Burying Beetle Conservation at the Saint Louis Zoo when the long-time director moved to another division at the Zoo. This paper will give a history of the Center's progress since its inception in 2004, the current status of the program at the Zoo and plans for the future, including succession planning for a new Center director.

11:00 am - 11:20am Kristin Rossetti and Matthew Standridge – McGuire Center for Biodiversity and Lepidoptera/ Florida Museum/ University of Florida

**The Cost of Captive Breeding for Two Endangered Species of Lepidoptera**

Captive breeding is one of several strategies in the toolbox utilized for endangered species recovery. Often criticized for its high expense, the cost of captive breeding is significantly lower for invertebrates v. vertebrates. We compare and contrast the cost of captive breeding of two endangered species of lepidoptera: the Miami Blue butterfly (*Cyclargus thomasi bethunbakeri*) and Schaus Swallowtail butterfly (*Heraclides aristodemus ponceanus*), for the purposes of reintroduction. The unique situation of rearing two endangered species of lepidoptera allows us to leverage resources and reduce costs. In addition, our captive rearing program repurposes low tech resources, resulting in cost effectiveness.

11:20am-11:40am Melissa Bushell - Bristol Zoo

**Tiny Snails Need Love Too! Collaborative Conservation of Critically Endangered Endemic Snails of Madeira**

A presentation on the joint efforts of Bristol Zoological Society, Chester Zoo and the IFCN (Madeira) to realise a conservation rescue mission to save some of the most endangered species of snail found in the Maderian archipelago. The initial focus is on Desertas Grande and focuses on four target species, but will potentially expand to cover other islands and even further species in a One Plan Approach.

11:40am -12:00pm Tiffany Moore – Zoo Miami

**Insect Conservation at Zoo Miami**

The pine rocklands is a critically endangered ecosystem, of which less than 2% of the original pine rockland habitat remains. Within Zoo Miami's property limits is the largest pine rockland preserve outside of the Everglades National Park. Two federally endangered insect species occur at the Zoo Miami pine rockland - the Miami tiger beetle and Bartram's scrub hairstreak butterfly. Zoo Miami has converted a World War II bunker into an environmentally sustainable butterfly lab, with solar panels, wind turbines and a rain catchment system. Zoo Miami conducts life history and conservation research within the lab on lepidoptera species that are native to the pine rockland. Zoo Miami conservation staff also conducts field research on the Miami tiger beetle within the pine rockland preserve.

Noon - 1:30pm COMPLIMENTARY lunch provided for conference participants - Presidio III,IV,V

**AFTERNOON WORKSHOPS**

1:30pm - 4:30pm **Tarantula Keeping Basics** – Palo Verde room

Led by Kiffnie Holt - Kansas State University

This workshop will cover the basics of tarantula keeping for institutions. Tarantulas are one of the animals that are donated to zoos when seized by the USFWS. They often arrive quite small and can be challenging to raise from this stage, especially when they arrive stressed and dehydrated. When breeding of adults is the goal, it is often helpful to separate out males and females at a juvenile size so that growth rates can be manipulated. Examples of shed exuviae from adults will be presented for examination and we will practice spreading and examining juvenile exuviae under a dissecting scope.

1:30pm - 4:30pm **Dyeing with Cochineal Insects** – Agave Ballroom

Led by Stephanie Dole – Beetlelady, LCC

Cochineal is an insect dye that has been used for centuries and has recently regained popularity as a natural dye for cosmetics, food, and textiles. In this workshop we will explore the biology and history of the cochineal bug. Participants will work with cochineal on paper to demonstrate a simple activity that

can be done in educational programs. They will also dye scarves provided at the workshop using a cochineal dye bath.

## ROUNDTABLE

1:00pm – 3:00pm **Invertebrates and Universities** - Presidio III,IV,V

Facilitated By Maia Holmes – Colorado State University

Multiple different Universities have involvement in using arthropods for education and attend IECC. I would like to get these people together to collaborate on how they manage funding, organizing events like Insect Festivals, and managing the revolving door of students.

FIELD TRIPS - Pre-registration required. All field trips should meet at Presidio Registration Desk

**Douglas Springs Night Hike (10 Participants) – Emma Califf and Courtney Christie, Arizona Sonora Desert Museum 5:30pm-9:30pm**

You've seen the Sonoran Desert during the heat of summer, but have you seen it come to life at night? Join Arizona-Sonora Desert Museum keepers Emma Califf and Courtney Christie for a leisurely night hike and discover the new world that comes alive under the stars. Nestled in the foothills of the Rincon Mountains, just up the street from Saguaro National Park East, Douglas Springs contains a high diversity of flora and fauna. When the sun goes down and the temperature drops (a little), we have a chance to see (not collect) a wide variety of native invertebrates, including but not limited to tarantulas, sun spiders, and scorpions, in addition to the extraordinary local herpetofauna, like Gila monsters, rattlesnakes, and toads. Wear closed-toe shoes, bring plenty of water, and bring a headlamp or flashlight if you have one. (We will supply extras). No collecting.

7:00pm – 9:00pm **INSECT TRIVIA AND GAME NIGHT** - Presidio III,IV,V

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**Friday, July 29**

7:00am - 4:00pm Silent Auction

7:30am – 4:30pm Please Visit Our Vendors

7:00am - 4:00pm Registration -- Registration may close during paper sessions and lunch. - Presidio III,IV,V

**PAPER SESSIONS**

8:00am Welcome and Announcements - Presidio III,IV,V

8:10am - 9:50am Let's Study That!

8:10am – 8:30am Joseph Genovesi and Karen Verderame – Hopewell Valley Central High School and Academy of Natural Sciences

**What do *Danaus*, *Diapheromera* and Dyslexia All Have in Common?**

Besides the fact that we can't spell any of them- they are part of an exciting new pilot project. Presented in October during Dyslexia Awareness Month, the program will introduce elementary students with dyslexia to the wonders of entomology while encouraging them to practice reading and writing skills.

We will brainstorm ideas for this exciting new program and share how your institution can join us in introducing students with diverse learning styles to the field of science including entomology.

8:30am – 8:50am Emily Justus & Gwen Pearson – Purdue Entomology

**The Insect Festival Evaluation Project: Preliminary Results from Bug Bowl 2022**

The Insect festival evaluation working group was formed in late 2019 to try to develop best practices and a common evaluation for the estimated 50+ insect festivals in the USA. 2022 marked the first formal evaluation of Bug Bowl in 32 years (!?) of both volunteers and visitors. This evaluation serves as a pilot case for the working group.

8:50am-9:10am Ren Garcia-Hellmuth - Colorado State University

**Teaching Genetics with Isopod Morphs**

During the Spring 2022 semester, Colorado State University piloted a lab activity using isopod morphs to teach basic genetics in a high-enrollment introductory biology lab. This paper will detail the process of developing this activity, use of live isopods in teaching, outcomes, and future improvements to this activity.

9:10am-9:30am Jacqueline Genovesi, Kimberly Godfrey, Aisha Doucoure, and Nia Murphy- The Academy of Natural Sciences of Drexel University

**Diversifying the Field: Encouraging Young Black and Latinx Women to Pursue STEM**

What do young women, especially young women of color, want and need in an internship and mentoring experience? The Academy will share 40 years of experience from its Women in Natural Sciences program and current research findings from its NSF project. Learn first-hand from program staff and students what works and what doesn't when mentoring and encouraging young women to pursue careers in STEM. Staff and students will share experiences of using the creepiest of critters as the first inspiration to step out of their comfort zone only to grow into confident, STEM proficient young women and future STEM professionals.

9:30am-9:50 am Announcements and Break

9:50am – 11:20am Igniting a Passion for Arthropods 9:50-10:10 Stephanie Dole - Beetlelady, LLC

**Pop-Up Museum**

Follow Beetlelady, Dr. Stephanie Dole, on her journey to develop a completely portable museum that can be set up in any space. The Pop-Up Bug Museum debuted in November 2022 and is an interactive exhibit about terrestrial arthropods that is available to rent for schools, museums, and events. It features specimen displays, graphic banners, activities, and live arthropods.

10:10am – 10:20am Margaux Judkins – Thanksgiving Point Institute (short)

**Growing Appreciation for Invertebrates Through Community Insect Collection**

How do we grow appreciation for invertebrates in our communities? Thanksgiving Point's Butterfly Biosphere recently started a unique program to encourage exploration and further understanding of

invertebrates. The Community Insect Collection and Trading Post intends to grow appreciation for invertebrates in our community by inviting guests to contribute their own photo observations or found specimens. Through facilitated discussion, participants practice science skills such as observation, record keeping, research, and curiosity. Come hear how this program was organized and what we're learning about how it affects participant critical thinking, conservation-mindfulness, and further investigation of the natural world.

10:20-10:40 Michael Chao – Student

### **The Japanese Insect Culture**

Insects have been considered pests in the U.S., with many fearing their existence. However, they are widely revered in Japan. The favorite summer activity for Japanese is to catch the famous Japanese Rhino Beetle. Japan's enthusiasm for insects has grown to almost cult-like popularity with dozens of insect stores selling hundreds of live invertebrates from all over the world. The hobby has even prompted a famous beetle arcade game and an animated series on television. This session will discuss the Japanese insect culture with anecdotal stories, actual specimens, and the many insect gadgets and tools used in Japan.

10:40am-11:00 Clayton Leopold - Moody Gardens

### **Invertebrate Gallery Renovation- and the Challenges that Came Along with It.**

Building a new exhibit can be challenging, renovating an exhibit with existing animals is a whole other ball game. Moody Gardens decided to renovate our rather empty exit gallery to display the underserved Invertebrates in our collection. The renovation will take our current species count of 9 (not counting feeders) to around 60. I would like to present how our process went, what we did wrong, and what we got right. The challenges of disinterest by the board, the pandemic, and short timelines are sure to make for an exciting presentation!

11:00am-11:20 am Paige Howorth – San Diego Zoo

### **Emotional Design and Invertebrates: Spineless Marvels 2.0 at the San Diego Zoo**

Wildlife Explorers Basecamp, San Diego Zoo's newest experience, is heavily focused on all-ages play and the little things that run the world. Using technology, innovative habitat design and even the smell of dirt, the McKinney Family Spineless Marvels is the centerpiece. Leveraging the concepts of emotional design, new possibilities for guests to engage in the world of invertebrates within are explored.

## ROUNDTABLE

11:20am - 12:00pm **USDA Permitting for Insect Zoos and Butterfly Houses** - Presidio III,IV,V

Facilitated by Wayne Wehling and Kirk Martin - APHIS - USDA APHIS PPQ

The USDA permitting round table will be an opportunity to discuss changes to permitting requirements that affect the Arthropod exhibit community in the United States. Significant new changes may be in place by conference time. This gathering is an opportunity to ask questions, get answers, and seek change.

12:00pm -1:30pm COMPLIMENTARY lunch provided for conference participants - Presidio III,IV,V

## AFTERNOON WORKSHOPS

1:30pm - 4:30pm **Butterflies and Odonates: Getting Started with New Community Science Programs**

Led by Doug Taron - Chicago Academy of Sciences – Agave Ballroom

Do you want to increase your institution's community outreach and involvement? A butterfly or dragonfly monitoring network may be just the thing. We will explore all aspects of setting up a program that collects data with the Pollard Survey technique. Topics covered will include volunteer recruitment and training, connecting with diverse communities, data management, interfacing with consumers of your data, mapping, and a whole lot more. The workshop will include hands-on exercises both online for data management and mapping methods and outdoors for setting up and running a survey route. It's fun and easy!

1:30pm - 4:30pm **Natural Born Botanists** – Palo Verde room

Led by John Randall Watts - Texas Discovery Gardens

Insects make the best botanists. This workshop is geared toward entomologists who oftentimes have never taken a botanical or horticultural course. Learn about how to identify flowering plants to family and how insects can help you narrow down what the plant is that they are on.

## ROUNDTABLE

1:30pm - 3:00pm **Invertebrate Welfare Roundtable** - Presidio III,IV,V

Facilitated by Erin Sullivan, Woodland Park Zoo and Paige Howorth, San Diego Zoo. This informal discussion will be focused on applying established concepts of animal welfare to enhance the lives of invertebrates in managed care.

## EVENING EVENT

7:00pm - 10:00pm **Black Lighting the Night Away** – Catalina State Park

We will provide all the equipment for a black light sheet and mercury vapor light setup. Participants will be able to pursue moths, wasps, scorpions, tarantulas, etc!

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SOPHIA M. SACHS  
**BUTTERFLY HOUSE**



**Saturday, July 30**

7:00am - 1:00pm Silent Auction

7:00am - 1:00pm Registration -- Registration may close during paper sessions and lunch. - Presidio III,IV,V

7:30am – 12:00pm Please Visit Our Vendors

**PAPER SESSIONS**

8:00am Welcome and Announcements - Presidio III,IV,V

8:10am - 9:30am Invertebrate Natural History and Managed Care

8:10am - 8:30am Julie LaTurner, Houston Zoo

**The Utilization of a Grilling-Pellet Based Substrate for Beetle Larva Rearing at the Houston Zoo**

The Houston Zoo began utilizing a grilling-pellet fermented substrate in 2020 to see if this helped with quality of beetles reared. This paper will cover the recipe for this substrate, the species reared, the time reduction for beetle rearing, and future goals for the utilization of this important substrate.

8:30am - 8:50am Zack Lemann, Audubon Butterfly Garden and Insectarium

**Cuckoo for Katydids**

The Oblong-winged Katydid (*Amblycorypha oblongifolia*) is typical of most insects in this group in that it usually mimics a leaf in both shape and color. However, nature will, on rare occasion, produce individuals that are pink, yellow, or brown. Our insectarium's efforts to initiate and maintain a breeding

group of brightly colored katydids met with good success about a dozen years ago, but we lost that colony. But a resurgence is underway, with recent progress highlighted here.

8:50-9:10 Lawrence Reeves - University of Florida, Florida Medical Entomology Laboratory

### **The Natural History of Mosquitoes**

Mosquitoes are among the most recognizable insects to human beings around the world. And, as vectors of disease-causing pathogens and as biting pests, they are among the most hated. Indeed, mosquitoes have had an outsized impact on our species throughout history, likely greater than any other taxon of wild animals. Despite this, mosquitoes remain poorly understood by the public. Educating people about mosquitoes can serve multiple purposes, from helping to reduce mosquito populations around homes and protecting against mosquito bites and mosquito-borne disease, to increased appreciation for beneficial insects, including some mosquito species, to heightened awareness for biodiversity more broadly.

9:10am-9:30am Nicholas Milone - Disney's Animal Kingdom®

### **Hunting for a New Species of Spider to Train**

Following the success of our jumping spider (*Phidippus regius*) training, we were on the “hunt” for a new species to model the target training project. We decided to continue the spider training program with our huntsman spider (*Heteropoda venatoria*). Huntsman spiders prefer dark, spots where they can use their speed and strong chelicerae to ambush prey. Given their almost polar opposite feeding and hunting strategies along with the differences in eyesight we investigated whether a huntsman spider can be trained to a laser light as successfully as a jumping spider.

9:30am - 9:50am Announcements and Break

9:50am -12:00pm We (Dorsal) Heart Invert Welfare

9:50am - 10:10am Tayler Dorleus - Laura Stalter, Disney's Animal Kingdom

### **Does Environmental Complexity Impact Tarantula (*Grammostola pulchra*) Behavior?**

Providing a complex habitat is crucial to sustaining animal welfare, as it has been associated with improved health and behavior outcomes. The effect of environmental complexity on invertebrates has not been well studied. This research aims to evaluate the behavioral response to exhibit design in tarantulas. We compare the behavior of Brazilian Black Tarantulas (*Grammostola pulchra*) after living in their typical, standard enclosure with their behavior after living in a more complex, enriched enclosure by using a combination of behavioral studies. The results will advance our understanding of tarantula care and welfare in human care. In this presentation, we will discuss the current husbandry processes at Disney's Animal Kingdom®, provide an outline of this study's process, and share preliminary results.

10:10am -10:20am Veronica Crump - Thanksgiving Point (short)

### **The Effects of Handling Stress on the Welfare of *Eurycantha calcarata***

*Eurycantha calcarata*, known as the Giant Stick Insect or New Guinea Walking Stick, are commonly exhibited in insect zoos, and are sometimes used as ambassador animals due to their relative ease of care and impressive size. The effects of handling on welfare are poorly understood. This paper will describe a welfare study begun at Thanksgiving Point's Butterfly Biosphere in January 2022 assessing the

effects of handling on growth rate, longevity, and fertility; and it will share the results discovered in the first six months, namely behavioral and growth rate differences noted thus far.

10:20am – 10:30am Marissa Harrison - Thanksgiving Point Butterfly Biosphere (short)

**Overcoming Rearing Challenges for the Philippines Leaf Insect, *Phyllium philippinicum***

This presentation will describe a rearing protocol for the Philippines Leaf Insect, *Phyllium philippinicum*, that the entomology team at Thanksgiving Point's Butterfly Biosphere has recently trialed with success. We've historically experienced challenges in rearing hatchlings past the 2nd instar in multiple species of *Phyllium*. In December 2021, losing most of our hatchlings yet again, we initiated a combination of changes to minimize light exposure, reduce handling stress during servicing, and increase access to host plants in the enclosure. These changes yielded immediately perceptible improvements and reduced the mortality rate from 73% to 33%.

10:30am - 10:40am Nathan Brockman Reiman Gardens - Iowa State University

**You Need Moth Flies (Psychodidea) at Your Institution**

Moth Flies (Psychodidea) make for a great feeder insect and should be utilized more at institutions. Learn how to obtain a founder population and method that allows you to rear large number with minimal inputs.

**HUSBANDRY/WELFARE BREAKOUT SESSION**

10:40am - 12:00pm

The Husbandry Break Out session is organized to promote the discussion of husbandry in our industry, and to expand on the topics presented in the preceding paper session. All are welcome to join! --  
Facilitator Erin Sullivan - Woodland Park Zoo

**ROUNDTABLE**

1:30pm - 3:00pm Animal Browse/Vegetation Needs - Presidio III,IV,V

Browse for invertebrates is very important, if not critical. This would be a round table to help each other with what types of browse we have been successful with and for what species. Lets share successes, surprises and challenges to supplying our collections with browse, not only for bug keeping veterans, but also for those new to the field.

Facilitated by Erin Sullivan, Woodland Park Zoo and Julie LaTurner - Houston Zoo

**WORKSHOPS**

1:30pm - 4:30pm Feeding Invertebrates - Brewing for Bugs! – Palo Verde room

Led by Kathryn Hokamp – Little Bug House

Learn to ferment fruit, mix specialized butterfly nectars, make beetle jelly, and more! Have you made rock candy for butterflies? Do you know what yeast to ask for at your local craft brewing store when the brew is for bugs? What do you do when your facility gets a 50-pound donation of ripe pears? Learn about the nutritional needs of various invertebrates and how to meet those creatively! This workshop

will mostly focus on butterflies and omnivorous terrestrial invertebrates, but we will talk about gut loading those feeders and good plants to grow for your herbivores as well!

#### BANQUET

6:00pm – 9:00pm Final Silent Auction bids, Cash Bar and Banquet - Presidio III,IV,V

We are pleased to announce that the following institutions are offering free admission during the week of the conference. Just show your conference ID badge to receive admission: Reid Park Zoo, Arizona-Sonora Desert Museum, Phoenix Zoo, Tohona Chul (plus 10% discount in the museum shops) and we are working on more!

## 2022 IECC Vendors

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