



# Beat Sheet

## The Newsletter of the Colorado Spider Survey

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### Arachnology Lab Update

The National Science Foundation (NSF) solifuge grant is going full speed (see *Beat Sheet* #30). Paula presented on the DMNS solifuge (camel spider) research program in November during the annual meeting of the Entomological Society of America in Vancouver, British Columbia at an invited symposium during which other colleagues presented about the cutting edge research being done in arachnology.

In February 2019, NSF-funded doctoral student, Erika Garcia and Master of Science student, Ryan Jones and Paula will attend the International Congress of Arachnology (ICA) meeting in Canterbury, New Zealand. Erika and Ryan will present posters on morphological structures on the pedipalps and abdomen of camel spiders that may be diagnostically informative (may be similar for different branches of the Eremobatidae evolutionary tree). Their data were acquired largely through the use of the newly purchased benchtop Scanning Electron Microscope (SEM) – another NSF funded improvement to the research capabilities of the Museum.

At the 2019 ICA meeting, Paula will give an overview of the lab's solifuge research program. During the ICA meeting, Paula will also give a presentation about curatorial best practices and the importance of online databases for the research community. She will also give a presentation at an invited symposium about "arachnological outreach for community engagement, conservation and research." Paula will talk about how she gets paraprofessionals involved in the arachnology program at the DMNS.

NSF funded REU (Research Experience for Undergraduates) student, Lance Herrera, has been busy increasing the digitization (imaging) of solifuge specimens in the DMNS arachnology collection. See "Arachnid Resources" section of the newsletter for a link to our solifuge images.

### Upcoming Events

January 10<sup>th</sup> Lecture: The Truth about Camel Spiders: January 10<sup>th</sup> from 3 – 4 p.m. Paula will give a lecture about the camel spider research program. This lecture is only open to current Museum volunteers and will be in the Volunteer Engagement Center at the Museum.

Late January/early February General Arachnology Class: January 28, 30 and February 6 and 8 from 6:30 – 8:30 p.m., Paula will teach General Arachnology at the DMNS. Learn the evolutionary history of arachnids—such as scorpions, camel spiders, daddy longlegs, and ticks—the natural history and biology of the different groups, and the medical and economic importance of these animals. Experience a behind-the-scenes look at the wealth of specimens in the zoology collections with Dr. Paula Cushing, curator of invertebrate zoology. This 8 hour class costs \$75 for Museum members and \$105 for non-members. There are still a few slots available. Go to <http://www.dmns.org/learn/adults/classes/general-arachnology/> to register.

March 28<sup>th</sup> 7 – 9 p.m. Collegiate Peaks Forum Series Lecture "On a Silken Thread": Buena Vista Community Center, 715 E. Main Street, Buena Vista, Colorado. Paula will be giving a lecture about our favorite beasties. The lecture is free.

April 14<sup>th</sup> "Spider Fact and Fancy" lecture by Paula: This lecture will be given at the 1<sup>st</sup> Bank Center in Broomfield, Colorado as part of the Colorado Lifestyle Expo. More details will be sent via the Arachnophile email distribution list.

June 16 – 20<sup>th</sup> American Arachnological Society annual meeting: The 2019 AAS meeting will be held at Washington and Lee University in Lexington, Virginia. More information about this meeting (and joining this scientific society) can be found at: <http://www.americanarachnology.org/>

### In Memoriam



Sheila Cox died March 18, 2018. Sheila was a committed DMNS volunteer –mostly in the bird collection but also collecting spiders for the arachnology collection during her frequent jaunts in the wilds of Colorado. Sheila was known for her crazy humor and good nature. She went along on many early Colorado Spider Survey collecting trips in the late-1990s. You can read more about Sheila's remarkable life at:

<https://www.legacy.com/obituaries/name/sheila-cox-obituary?pid=188518701>



Bea Vogel died on December 7<sup>th</sup>. Bea was 88 and died from injuries sustained after climbing up a step ladder. If you knew Bea, that spirit of independence and do-it-yourself attitude would not surprise anyone! Bea was the first President of the American Arachnological Society and was instrumental in the official formation of that society. She was born in Montana, where she also died; received her Bachelor of Science degree from Stanford University; her Master of Science degree

from the University of Colorado, Boulder; and her PhD from Yale University. She was known for her work with wolf spiders in the genus *Pardosa* and had a species, *Pardosa vogelae*, named after her. Her private collection of spiders formed the basis for the now extensive arachnology collection at the DMNS. The archives at the DMNS also hold all her many years-worth of field notes. She was also known for her social activism and was involved in the anti-war demonstrations at Kent State and marched for women's rights. Her obituary is posted at

[https://helenair.com/news/local/obituaries/vogel-beatrice-roesle/article\\_0a7318d5-bc93-538a-9877-a0f1a071b7b2.html](https://helenair.com/news/local/obituaries/vogel-beatrice-roesle/article_0a7318d5-bc93-538a-9877-a0f1a071b7b2.html).

### Arachnid Resources

The DMNS Arachnology data can be found (and searched) at <http://scan-bugs.org/portal/index.php>.

As part of our NSF-funded project studying camel spiders in the family Eremobatidae, we are creating an online photo guide to species in this family with the help of REU student Lance Herrera and high school intern, Felix Channiago. To see some of Lance and Felix's marvelous photos, go to

<http://scan-bugs.org/portal/checklists/checklist.php?cl=108>

ArachnoServer

(<http://www.arachnoserver.org/mainMenu.html;jsessionid=5C91CF30518F874969D18BF5B23C6E8B>) is an online database containing information on proteins associated with spider venoms.

### Arachnids in the News

Maybelline spider models? In August, Lisa Taylor's lab at the University of Florida gave jumping spiders a makeover by painting over the bright red markings on the cephalothorax of the jumping spider *Habronattus pyrrithrix* with black eyeliner or giving species of the genus *Maevia* false eyelashes to test how important the male's visual signals are in attracting mates. Clearly this represents a new market for make-up retailers!

New species of high elevation tarantulas described. In August, Nelso Feretti and colleagues described several new species of tarantulas in the genus *Haplotremus*, some of which live more than 14,700 feet in elevation high in the Peruvian Andes.

"Migrating tarantulas" in southern Colorado. The annual mass movement of lonely male tarantulas

seeking love in southern Colorado received a lot of good press this year. In September, the Denver Channel interviewed Paula about this mating movement of male tarantulas in the genus *Aphonopelma*. As readers of the *Beat Sheet* know, in late summer / early fall, male tarantulas leave their natal burrows to find females, who stay put in their own burrows. When a lucky lady love is found (probably via airborne pheromones), the male knocks outside her burrow and may even waft perfumes of his own to entice her out. Read more about this annual phenomenon at:

<https://www.thedenverchannel.com/news/local-news/troops-of-tarantulas-arachnids-become-commonplace-in-southeastern-colorado-during-mating-season>

Also in September, Paula's colleague, Brent Hendrixson, who happens to be a tarantula expert was in town to visit family so Paula convinced him to give a tarantula talk at the Museum (his talk was excellent). And the day before, Paula was scheduled to give an interview on the radio show "Colorado Matters" about the male tarantula movement so she convinced the radio host to have two spider experts on the show. Listen to Paula and Brent being interviewed on "Colorado Matters" at <https://www.cpr.org/news/story/a-mass-tarantula-migration-may-sound-terrifying-but-theyre-just-looking-for-love>

A blanket of spider silk in Greece. In September a report and accompanying photos hit the news of a shoreline in the Greek town of Aitoliko blanketed by spider silk. Greek arachnologist, Maria Chatzaki, thought that the spiders were likely long-jawed spiders in the genus *Tetragnatha*. Maria said that hot, humid weather likely triggered an increase in mosquitoes and the spiders took advantage of the bounty, creating a spider population boom. Google spider webs Aitoliko to see photos of this phenomenon.

Never Home Alone. In November, ecologist Rob Dunn published a book by that title about the incredible diversity of life forms sharing most of our homes with their human inhabitants, including a good diversity of beneficial (of course!) spiders.

How to milk a spider. A study by Zhanqi Chen at the Chinese Academy of Science reported on a species of jumping spider from Southeast Asia, *Toxeus magnus*, whose moms produce a milk-like fatty liquid that the females use to supplement the diet of their spiderlings. Chen thinks the "milk"

may be derived from unfertilized eggs in the female's abdomen that the mother has recycled into this yummy food. The study was published in the journal *Science*. And cows thought they were soo special!

Gift giving spiders. Just in time for the holidays, a study published in the *Journal of Arachnology* by Michael Maxwell and Pavol Prokop tests the benefits of gift giving in the nursery web spider, *Pisaura mirabilis*. Males of this species (and in many others) present gifts to potential mates in the form of silk wrapped insect prey. Although catching and wrapping (but not feeding on) an insect gift may be metabolically expensive for males, such nuptial feeding, or gift giving, may benefit the male if the gift is attractive to a potential mate and, thus, maximizes the male's chance of mating; if the gift distracts the often larger female, keeping his lady love from cannibalizing him; and if the gift increases the number of offspring he sires with the female. The authors found that males were able to copulate longer with females if they presented her with larger gifts (in this case, wrapped crickets). Males were also more likely to successfully copulate when they had gifts to present to females. The food gifts may increase the females' reproductive outputs, but the authors note that such benefits may depend on the females' feeding histories and the number of gifts consumed. This holiday season as you place your wrapped presents under the Christmas tree, keep an eye out for tiny little silk wrapped crickets – the Christmas spider may have done its own holiday shopping.

## Participant News

Justine Quirk, arachnophile extraordinaire and student at Great Falls College (part of Montana State University) started communicating with Paula back in October about the best ways to raise camel spiders. Justine took a video of her solifuge pet that she sent to Paula's former PhD student, Laurie Kerzicnik, now an extension entomologist at MSU. Laurie put Justine in touch with the DMNS camel spider group. Justine's pet is named "Octavious" and she is still alive as of December.

Justine's interest in these curious arachnids spurred a professor at MSU to set her up in the Student Research Lab with an aquarium and a heat lamp. Justine has spent many hours observing Octavious to better understand the creature's biology.

Her research resulted in a very nice article published in the Great Falls College MSU Campus

News report in November. On December 21, Justine sent an update and said, “The solifuge is doing well. I finally got a good look at it and it is a female. January 2<sup>nd</sup> is three months. I think it’ll make it but now that I’ve said it, it likely won’t happen. Everything is going well though. We’re on our holiday break so my times visiting it are limited but I think everything is fine. I think the minimalist approach seems to work really well. I don’t stay for long, I provide the food and water then leave. I’m hoping to get a grant to either go and collect more or have them delivered...Either way I plan to continue this even when this one dies. I hate creepy crawlies but not this one.”

Clearly the fascination of camel spiders has converted Justine to our arachnophile folds!

Beck the Tech. In November, Paula received a message from Beck the Tech saying: “I don’t know if you remember me. I’m the one with the perpetual Orb Weavers every year. I have an even bigger one this fall. Problem is there are no more flies or miller moths to eat.” She asked for advice. Paula suggested pet store crickets and said to wiggle them in the web to get them stuck.

Beck the Tech wrote back: “Maybe I’ll try the crickets again. She survived in the pet carrier the last 2 days...I got a small carrier for lizards and such a couple years ago, put in sticks and leaves as you recommended, and a bit of water. Need to get a sponge if she survived last night. She hasn’t spun a web yet, but I’ll let you know if she does. She had a grand one over the garage door hinge, and I’m lucky to have a spouse that allowed me to indulge in keeping her without opening the garage door since August. A bit extreme maybe, but we rarely take those cars out, and she has been a blast to watch! Went all the way up to the ceiling, then DROP, like [she] rappelled down to a box on the floor where she anchored it. Wonderful engineering.

The *Beat Sheet* editor welcomes arachno-stories from readers, particularly those from closet arachnophiles with understanding spouses!

Amie and Talia Perea. Talia is a young budding arachnophile who used to live in the Denver area but has moved with her mom Amie to Arizona. In November, Amie wrote, “Hello. I had to reach out and tell you – Talia had an assignment here at her new school in Arizona for science class. Each student had to write a paper on their favorite scien-

tist, or a scientist that inspires them. Naturally there were a lot of Edison papers, Einstein, Madame Curie, etc. Talia chose instead to write her paper on the most inspiring scientist she knows [the DMNS arachnologist and *Beat Sheet* editor]. So now, 24 middle school kids in Gilbert, AZ have heard all about Paula Cushing and the importance of arachnid science.”

The *Beat Sheet* editor is honored and fully expects to see Talia Perea become a published scientist in the *Journal of Arachnology* some day!

### **Miscellany**

The *Beat Sheet* editor wishes all readers a very happy holiday season. Look for more arachnophile news in 2019!