



# American Arachnology

## Newsletter of the American Arachnological Society

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### Welcome to the re-instated American Arachnology

The last issue of *American Arachnology*, the newsletter of the American Arachnological Society (AAS) was published in April 2010. At that time, the Executive Committee of the AAS decided that news could be disseminated electronically via the [AAS website](#). Since publication of a biannual society newsletter was included as a society function in our constitution, the Executive Committee decided to ask membership during the last election if it would like to re-instate this newsletter or to remove mention of this publication from the constitution. Membership overwhelmingly decided it would like the newsletter re-instated.

*American Arachnology* will serve as a mechanism for publishing society news, funding opportunities, job announcements, as well as short articles from members. If you have interesting observations or news of interest to colleagues, send these items to your society Secretary, [Paula Cushing](#). The newsletter will be distributed electronically and will be posted on the society website. It will be published twice a year – once in the Spring prior to the annual meeting and once in the Fall. We rely on you, the readers, to keep this newsletter relevant and interesting!

### Report from 2018 AAS Meeting By Sarah Rose

The 47<sup>th</sup> annual meeting of the American Arachnological Society meeting was hosted by Dr. Cara Shillington and Dr. Anne Danielson-Francois at Eastern Michigan University in Ypsilanti Michigan from the 22 – 26 June 2018. There were 111 attendees from as far away as Taiwan and Brazil. Attendees were greeted by enthusiastic volunteers at the Student Center, which according to the College Rank is the number one student union in the country. Friday evening

was highlighted by a reception with plenty of food and a chance to catch up with old friends and meet new ones.

There were over 50 talks and 25 posters presented. These fell into the categories of Evolution and Systematics, Silk and Web, Venom, Ecology, Reproduction, Predation, and Behavior. A complete list of the abstracts for all the talks and posters can be found on the [AAS website](#). Additionally, there was a casual night, with presentations that were less scientific. Casual night could almost be described as “open mic night” for arachnologists. There were several presentations of spectacular photos from around the globe, including some by macrophotographer extraordinaire, Joe Warfel, amusing videos of arachnid behavior, and a chance for presentations and conversations in a less formal format.



Joe Warfel in full photographic regalia.

All the bells and sirens were on display for the Saturday evening social at the Michigan Firehouse Museum. Home to the rare 1917 American LaFrance fire engine, a collection of bells, fire engines, extinguishers, and many other firefighting related items, the multilevel museum occupies over 26,000 ft<sup>2</sup>. Matt Lee, in period firefighter attire, was on hand to provide insights into some of the historic items housed in the museum, and lead small personalized tours. For more information on the Michigan Firehouse Museum please check out their [website](#). Drinks from the Ann Arbor Distilling Company and ice cream from Go! Ice Cream (including chocolate covered insect toppings) were provided.

The banquet was held at the [Henry Ford Museum](#). Within the over 500,000 ft<sup>2</sup> exhibit hall there were a variety of displays. These ranged from an Allegheny class steam locomotive (the most powerful steam locomotive ever built) to the actual bus that

that Rosa Parks was arrested on for not giving up her seat, as well as a large collection of automobiles from many periods in history. One could get lost in the hallway of art glass, or the extensive furniture collection. It was far too much to see in one evening, but made for an awesome backdrop for the banquet. A very successful auction was held after dinner, and raised over \$1600 for the American Arachnological Society. (Please consider donating your arachnological items for future meeting auctions). The student awards were also announced at the banquet.

Sarah Han’s talk titled “The triangle spider drives prey capture through external power amplification” was the first place paper winner. This spectacular talk highlighted the first recorded external power amplification in a non-human animal. Ms. Han articulately described how spiders in the genus *Hyptiotes* draw their web back similar to an archer pulling back a bowstring. The second place paper presentation went to Ella Santana-Propper for her talk titled “Evolution and functional specificity in venom toxins from Sicariid spiders”. The winner for the Poster Presentation category was Megan Archdeacon for the poster titled “The Effects of Glyphosate and Body Condition on Courtship and Cannibalism in an Agrobiont Wolf Spider.” Congratulations to the winners, and thanks to everyone for all the wonderful talks and posters.



Allegheny steam locomotive at the Henry Ford Museum.



Karen Cangialosi receiving her plaque of recognition from AAS President, Rich Bradley (left); Cara Shillington, meeting host and next AAS treasurer fortifying herself for the tasks at hand.



Dr. Karen Cangialosi received a plaque of recognition from the AAS for 15 years of extraordinary service to the society as the Treasurer! Karen received a standing ovation for her service and her big smile suggested her pleasure at handing over the Treasurer's duties to the meeting host, Cara Shillington.

Rich Bradley also announced a recognition for Bruce Cutler for his long history of service to the society. Unfortunately Bruce could not join us to accept our thanks because he was at home awaiting the imminent arrival of a grandchild. Deborah Smith delivered the plaque to Bruce on her return to Kansas.

Tuesday morning several attendees boarded a coach bound for the Kresge Environmental Education Center at Fish Lake in Lapeer for a collecting field trip. The weather was ideal, warm with light breezes, and no precipitation. The site has heterogeneous topography, with bogs, deciduous and coniferous forests, fields, and lakes. There were lots of *Frontinella pyramitela* (bowl and doily spiders) webs in all the shrubs.



Bruce Cutler doing what he does best – collecting salticids (2016).



*Diplocephalus nigra* with eggsac.

Additional species seen and collected included *Trabeops aurantiacus* and *Diplocephalus nigra* (which created an egg sac in the collection vial before I could get her home). A *Thamnophis sauritus* (ribbon snake) was also observed and handled by some of the attendees. Many additional species were collected and identified, adding to the list of known species from the site. The coach ride home provided many opportunities to show off photos and specimens collected.

All in all it was a very successful and enjoyable meeting. Hope to see you next year at the 48<sup>th</sup> annual meeting hosted by Dr. Nadia Ayoub at Washington and Lee University in Lexington, Virginia June 16-20<sup>th</sup>, 2019.



## 2018 Student Presentation Winners



Presentation winners (left to right): Sara Han with Rich Bradley and Chair of the awards committee, Greta Binford; Ella Santana-Propper; and Megan Archdeacon.

## 2018 Student Travel Award Winners

Every year the AAS provides [travel support](#) to help students with limited funding to attend the annual meeting. The 2018 travel grant award winners included: Nancy Lo Man Hung, Universidade de Sao Paulo, Brazil; Colton Watts, University of Nebraska-Lincoln, USA; Guilherme Gainnett, University of Wisconsin-Madison, USA; Dragoslav Radosavljevich, University of Massachusetts, Lowell, USA; Vashti Mahadeo, Adelphi University, New York, USA; and Tierney Bougie, San Diego State University, USA.

Applications for the AAS travel awards are based upon clarity of the abstract (i.e. clearly stated hypothesis, conceptual framework for study, clear and appropriate methods, summary of results, conclusion), stated need for funding, personal benefits for attending the meeting, and a letter of support.

## 2018 AAS Research Awards

The AAS has two different [student research awards](#) available: the Arachnological Research Fund (ARF) and the Vincent Roth Fund for Systematics Research (VRF). Submission deadline for both grants is February 15<sup>th</sup> of each year. The ARF provides awards up to \$1,000 to support projects related to any aspect of the behavior, ecology, physiology, or evolution of any of the arachnid groups. The VRF provides awards up to \$1,000 to support projects focused on the taxonomy or systematics of any arachnid group.

2018 ARF winners were:

- Seira Ashley Adams, PhD student. (\$1000) (Title: Chemical recognition cues in an adaptive radiation of Hawaiian spiders)
- Alexander Dean Berry, PhD student. (\$1000) (Title: A test for predator-induced maternal effects in *Pardosa milvina*)

- Carson Lewis Bowers, Masters student (\$1000) (Title: Cover cropping to promote spider diversity in cotton agroecosystems)
- Angela Chuang, PhD student. (\$1000) (Title: Parasitoid-host dynamics between the native and invasive ranges of *Cyrtophora citricola*, a globally invasive spider)
- Tyler B. Corey, PhD student. (\$908) (Title: Testing the hypothesized antipredator function of stridulation in the spiny orb-weaver *Micrathena gracilis* (Walckenaer))
- Richard Ryan Jones, Masters student. (\$500) (Title: Movement Patterns and Burrowing Behavior in North American Camel Spiders (Solifugae))
- Nancy Lo-Man-Hung, PhD student. (\$1000) (Title: Roles of genetic drift and natural selection in quantitative trait divergence in spinneret diversity (Arachnida: Araneae))
- Callum James McLean, PhD student. (\$500) (Title: The biomechanics of amblypygid pedipalps: a functional trade-off?)
- Zeeshan Ayaz Mirza, Masters student. (\$500) (Title: Phylogeny and systematics of endemic tarantulas of Western Ghats (Theraphosidae: Thrigmopoeinae))
- Camila Pavon, Undergraduate student. (\$1000) (Title: Maintenance of alternative mating tactics in a Neotropical gift-giving spider)
- Emily Victoria Whitney Setton, PhD student. (\$1000) (Title: Investigating the developmental origin and genetic architecture of spider spinnerets)
- Salvatore A. Sidoti, PhD student. (\$500) (Title: Transgenerational Predator Stress Influences Behavior in a Wolf Spider (Araneae: Lycosidae))

2018 VRF winners were:

- Lisa Chamberland, PhD student. (\$1000) (Title: Evolutionary history of eye size in Deinopidae)
- Erik Andrew Ciaccio, Masters student. (\$1000) (Title: Generic phylogeny, species delimitation, and patterns of diversification in a cryptic paleoendemic spider (Araneae, Hypochilus ) from the California southern Sierra Nevada)
- Aaron Michael Goodman, Masters student. (\$420) (Title: Systematics of an Unusual Group of Canopy Dwelling Scorpions (Buthidae: Centruroides) and Exploration of Niche Partitioning Differences Among Sympatric Species)
- Ivan Luiz Fiorini de Magalhaes, PhD student. (\$1000) (Title: Systematics of the crevice-weaver spiders (Araneae: Filistatidae))
- Rodrigo Monjaraz-Ruedas, PhD student. (\$750) (Title: Systematics of the Short-Tailed Whipscorpion Genus *Stenochrus* Chamberlin, 1922 (Schizomida: Hubbardiidae))
- Jayson Alexander Slovak, Masters student. (\$750) (Title: Origins and Affinities of the Scorpion Diversity of Ethiopia)

The society also sponsors a non-student research grant program, the [Herb Levi Memorial Fund for Arachnological Research](#), or HLMFAR. This fund was established by the AAS in 2015 to support non-student AAS members (including post-docs) who receive little to no institutional

support for their research programs. The HLMFAR grant is primarily meant to provide seed money to fund fieldwork and to gather preliminary data for future grant proposals. Typical Award: \$500 to \$2000. Submission deadline is February 15<sup>th</sup> of each year. Chair, [Dr. Petra Sierwald](#). This year's recipients were:

- Macarena González, postdoc, Instituto de Investigaciones Biológicas Clemente Estable (IIBCE), Montevideo, Uruguay
- Lizzy Lowe, postdoc, Macquarie University, Sydney, Australia
- Brent Stoffer, visiting assistant professor, University of Cincinnati, Ohio, USA

### **Funding Opportunities**

Information about student and non-student travel grants to annual meetings can be found at: [http://www.americanarachnology.org/grants\\_and\\_awards/travel\\_grant.html](http://www.americanarachnology.org/grants_and_awards/travel_grant.html)

Information about student and non-student research grants can be found at: [http://www.americanarachnology.org/grants\\_and\\_awards/research\\_grants.html](http://www.americanarachnology.org/grants_and_awards/research_grants.html)

Guidelines for students participating in the annual student presentation competition at the annual meeting can be found at: [http://www.americanarachnology.org/grants\\_and\\_awards/documents/student-paper-guidelines-2017.pdf](http://www.americanarachnology.org/grants_and_awards/documents/student-paper-guidelines-2017.pdf)

### **Ballot Results**

Each year the society elects a certain number of new officers to serve on the AAS Executive Committee. The current members of the governing body can be found on the [AAS website](#). In 2018, members voted for Paula Cushing to continue serving as society Secretary.

Nadia Ayoub was elected to serve as one of the society's three Directors.

Members also voted for several constitutional issues. They decided to merge a previous AAS document entitled "AAS Officers Duties" with the [AAS Constitution](#).

Members voted to re-instate a twice yearly society newsletter to provide an outlet for ideas, short articles, and discussions; promote society products; advertise upcoming annual meetings and events; and report on society-related news. The newly instated newsletter will be distributed to membership as a pdf document and will be called (as previously), *American Arachnology*. The Secretary shall be responsible for producing the newsletter and the Membership Secretary shall be responsible for its distribution. It will also be made available via the AAS website.

Members voted to change the Webmaster from a voting to a non-voting member of the Executive Committee (this constitutes a change in the previous AAS constitution).

Members voted for the following resolution: "All Constitution Article 5 Executive Committee members (including the President, President Elect, Secretary, Treasurer, three Directors, Editor-in-Chief, Membership Secretary, Webmaster, Parliamentarian, and Archivist) have the option to have their registration fee costs waived for the annual meetings. The costs of this shall be borne by the society, not by the local host committee."

## AAS – European Society of Arachnology Reciprocal Award for Students

The European Society of Arachnology submitted a proposal in 2018 to the Executive Committee of the American Arachnological Society that the winners of the European Congress of Arachnology (ECA) presentation competition be awarded a green membership to the AAS and that winners of the AAS student presentation competition be awarded both free membership to the ESA and free registration to the next ECA meeting.

### University of Kansas Collection Deposition By Bruce Cutler

I have deposited the bulk of my collection in the Entomology Division, Biodiversity Institute, University of Kansas. The collection consists of several thousand vials, with only those specimens in groups I am currently working on or requiring more detailed curation on my part, being retained by me. Over time those retained vials will be added to the University of Kansas collection. Most of the material is identified to the species level, though some names in vials are obsolete (eg. *Pelegrina flavipedes* vs. *Pelegrina flavipes*, etc.). As should be obvious, well over 90% are salticids. Of the remainder, there are numerous other spider families represented, with no family predominating. A few representatives of other arachnid orders are included. Geographically the specimens are overwhelmingly from the central states of Minnesota and Kansas, but numerous other Nearctic areas are represented also. There are a fair number of Neotropical specimens as well, in some cases species and generic determinations of the Neotropical material are older and thus may not be up to date. There are a small number of Old World specimens also. I did not retain any types, although there are examples of non-type description series of a few species. For information about availability, borrowing, etc. contact the Collection Manager, Zachary Falin, [ksem@ku.edu](mailto:ksem@ku.edu), or Associate Collection Manager, Jennifer Thomas, [jct@ku.edu](mailto:jct@ku.edu)

### On Egg Sacs and Nests of *Araneus trifolium* Text and photos by Darius A. Przygoda

*Araneus trifolium* (common names: *shamrock spider* and *pumpkin spider*) is an orb weaver native to the United States and Canada. The spider has a distinct pattern on the abdomen resembling a shamrock (hence one of the common names). The abdomen color may vary from green, through orange, to reddish brown. Adult females of *A. trifolium* can grow up to 20 mm total body length.



*Araneus trifolium*, adult female.

*Araneus trifolium*'s webs can reach a couple of feet in diameter, especially in the fall, when females get big and are ready to lay eggs. The spiders sit either in the hubs of their webs, or in the retreats made of curled leaves and located close to one end of the web's bridge thread.

This text contains observations of *A trifolium*'s egg sacs (in the fall), and a process of spiderlings' dispersal after leaving the cocoon (during spring). Observations were performed in 2017/2018, in Half Moon Bay, California.

In Half Moon Bay *A. trifolium* start leaving cocoons in the beginning of March, the peak of this activity is placed in the beginning of April, and all spiderlings leave cocoons by the beginning of May. It is important to note that in Half Moon Bay winter is warm (the temperature almost never falls below the freezing point, even during the nighttime), and the humidity is high because of the presence of the Pacific



Ocean, so these conditions may be different from the "normal" conditions the spiders can find inland.

In a few cases the spiders were observed at the very last stage of closing the cocoon wrap, and it allowed for identifying the egg sac as that of *A. trifolium*.

**Date, time, location, weather.** The egg sacs were found in Half Moon Bay, California, on Cowell-Purisima trail (37°24'15.3"N, 122°25'27.4"W). First observation took place on the 25th of November 2017, 12:45 a.m. The temperature was about 70°F, sunny. There were a few rainy periods (each a couple of days long) during the previous few weeks.

**Environment.** The egg sac was located in blackberry thicket growing along the trail. The spiders that are ready to lay eggs do not spin the orb part of the web; the only remaining part is a bridge thread with the spider's retreat located nearby. The bridge thread consists of one thick silk line splitting up into several thinner lines close to the end. The length of the bridge thread remains within 1-2 feet. The egg sac was located in the thicket, about 2 feet from the end of the bridge thread. There was no visible silk connection between the egg sac and the bridge thread.



Egg sac wrapped in blackberry leaf.

**Egg sac.** The egg sac consisted of the ball of eggs (egg mass) surrounded by a loose layer of tangled silk of average diameter 18.6  $\mu\text{m}$  (15 measurements taken at random places, with minimum result = 16.2  $\mu\text{m}$  and maximum result = 20.4  $\mu\text{m}$ ). The egg sac was surrounded by a shell made of the curled leaf (possibly two leaves stitched together). The egg sac was attached to the surface of the leaf at one location, and connected with the remaining surface of the leaf by sections of straight silk lines resembling a space filling web structure. The leaf structure was open at one side, resembling a taco. There was sparse webbing around the leaf.

The technique of building the egg sac shell by *A. trifolium* is very similar to the one used during building retreats. The spider uses either a single, rolled up leaf, or a few leaves stitched together with silk.

Most likely the spider builds the shell, then makes a basal plate out of wooly silk (the plate is attached to the inside of the leaf), lays eggs, covers eggs with wooly silk such that it forms a ball, and then fastens the wooly silk ball to the inside of the leaf (or leaves) with silk "beams." Then the spider closes the shell with external webbing. (I have not observed the entire process, but did put together momentary observations and conclusions drawn from the egg sac disassembly.)

The height of the locations of the egg sacs and the nests were most likely related to the height of the thicket, varied between 2ft. and 5ft. from the ground level, and placed deeper in the thicket (1- 2 ft. deep). A couple of egg sacs were located in the front of the thicket.

The *A. trifolium* female does not take care of the egg sac, but abandons it after finishing. The female spider makes only one egg sac.

The process of emerging and dispersal of spiderlings is described below.

1. Spiderlings of *A. trifolium* start leaving cocoons in the beginning of March, approx. 3-4 months after females laid eggs.



Spiderlings leave the cocoon most likely early morning, before sunrise. (Unfortunately I never witnessed this event; this conclusion is drawn from observation of over 30 nests.)



Before dispersal (notice exuvia between spiderlings).

2. Having left the cocoon, the spiderlings build a silk structure in the vicinity of the empty cocoon (typically a few inches apart). The structure resembles a space filling web. In most cases a conical structure of beams points to the cocoon.

3. The cocoon is usually hidden in the vegetation. The cluster of spiderlings that left the cocoon (entire cluster) keeps moving towards open space (probably driven by the light or the heat of the Sun). On their way they build more silk structures similar to the one described above. Depending on the density of the vegetation, the "trail" may look like separate space

filling structures separated by empty "nodes," where the conical beams converge, or like a contiguous "veil." The trail of the silk structures the spiderlings leave behind may be straight or zigzag, depending how easy it is to travel from one place to another. For instance, in Half Moon Bay, where the cocoons were located in the dense blackberry thicket, it was easy to move straight, and the silk trail was straight. In Mountain View, where the cocoons were placed in the dwarf sequoia tree, the spiderlings followed the twigs and branches, and the silk trail formed a zigzag.

4. The spiderlings molt outside the cocoon. Depending on how fast the spiderlings can move (migrate) towards open space and how soon they can reach it, sometimes groups of spiderlings molt earlier, in the silk structures mentioned above.

5. The spiderlings disperse after molting. Since not all spiderlings molt at the same time, the number of spiderlings in the nest gradually gets smaller. Observed ways of dispersal were

either by ballooning, or by letting go a filament which gets stuck to the nearby twig, or (if conditions are right), by walking away over vines and leaves. I was not able to pinpoint the time interval between molting and dispersal of a particular spiderling.



Empty egg sac (blue), silk trail left by spiderlings (red), and nest (yellow).

6. Before dispersing, the spiderlings recycle some of the webbing. There is always some webbing left behind, with exuvia embedded into it. It makes a trail showing which way the cluster of spiderlings was moving.

7. Some of the spiderlings, after dispersing, can no longer be found in the vicinity of the cocoon; others (aminority) make small webs in the vicinity of the nest (up to 10 ft.). Some of those after a day or two recycle the web and migrate farther.

8. The empty cocoon remains in place along with the leftover webbing left behind (with exuvia embedded in the silk).

The process of dispersal, observed in Mountain View, took about 11 days, and the dispersal rate was nonlinear: half of the spiderlings dispersed after 2 days, it took 9 days for the remaining spiderlings to disperse. On the 12<sup>th</sup> day there were no spiderlings left in the nest.

*I would like to thank Prof. Richard Bradley for his never ending support and patience, and Richard J. Adams for his encouragement and enthusiasm. Without them, this text would never be written.*

### **Journal of Arachnology News of Note**

The *Journal of Arachnology* has become the premier publication for peer reviewed articles about arachnids. As of April 2018, the *Journal* had achieved an Impact Factor of 1.236!

The AAS encourages members to submit original research to the *JoA*. [Submission is now done online](#). Instructions to Authors can be found by following this same hyperlink.

The Editors also welcome ideas for Review articles, which can be submitted to the Editor in Chief, [Deb Smith](#).

Current issues of the *JoA* are accessible online to AAS members. Issues more than one year old are made freely accessible to members and non-members via the [AAS website](#).

The society Secretary with the *JoA* editors choose upcoming articles of general interest to highlight via a Press Release sent to various online and print publications.

### **Other AAS News for Members**

AAS members receive a greatly reduced price for [Spiders of North America: an identification manual](#). Member's price is \$50 per copy. No online retailer can provide such a reduced discount! Buy your copies of SNAIM for your next Invertebrate Zoology, Spider Biology, or General Arachnology class.

The 21st International Congress of Arachnology will be held at Lincoln University, Canterbury, New Zealand from 10-15 February 2019. Our hosts Cor Vink (Canterbury Museum) and Peter Michalik (University of Greifswald) have provided details at the following web site: <http://arachnology.org/21st-ica-2019.html>