



American Arachnology

Newsletter of the American Arachnological Society

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Report on American Arachnological Society meeting, Ithaca, New York



The annual meeting of the American Arachnology Society will be held at Cornell University campus in Ithaca, New York from 25 – 29 June 2023 hosted by Linda Rayor and Matthias Foellmer. It was a great success. The meeting program included three outstanding keynote speakers. Daiqin Li presented “Bird-dropping masquerade in *Phrynarachne* crab spiders: a bird’s eye view.” Hannah Wood presented “Palpimanoid spiders: bizarre morphologies, unusual behaviors, and extreme speeds.” George Uetz gave an amazing overview of his extensive and diverse research career in “Rainforest to research lab: studies of the social life (and sex life) of spiders.” All these keynote addresses are available for viewing on the American Arachnological Society’s YouTube channel (URL below). Click on “Playlists” to find the 2023 Keynote talks.

<https://www.youtube.com/@americanarachnologicalsoci878/featured>

The meeting also included a series of fascinating symposia including ones focused on Sensory Ecology, Behavior & Machine Learning, Evolutionary Trends in the Arachnid Tree of Life, and Chronobiology. In addition, attendees enjoyed walks around Ithaca’s gorgeous gorges, were entertained by silent and live auctions at the banquet as well as a DJ.

2023 AAS Student Presentation Winners

Judges at the 2023 meeting in Ithaca, New York had a difficult time choosing winners of the Oral and Poster presentations among all the excellent student presentations.

The winner for oral presentations was Alex Winsor for “Visual object categorization in the jumping spider brain.”

The runner-up was Becca Robertson for “Effects of symbiotic communities that manipulate spider reproduction and phenotype in response to selection.”

The winner of the poster presentations was Aislinn Shilcusky for “Does *Atypus karschi* use projectile defecation as a drift fence trap?”

The runner-up for posters was Gia Ramos for “Identification and expression of protein regulators of the spider circadian clock.”

Congratulations to these winners and to all the students who presented at the meeting!



Andy Roberts, AAS President, next to (from left to right): Alex Winsor, Becca Robertson, Aislinn Shilcusky, and Gia Ramos.

Greta Binford honored

During the 2022 AAS meeting held in Davis, California the AAS presented a well-deserved plaque recognizing the extraordinary leadership of Dr. Greta Binford who kept the society active, productive, and healthy during the pandemic. This plaque acknowledged Greta’s efforts in:

- Leading the society through a challenging global pandemic.
- Organizing and hosting two virtual conferences with record-breaking, international attendance.
- Launching a new AAS website.
- Establishing the Engagement and Outreach Committee.
- Initiating society-wide conversations about diversity, equity, and inclusion.

Given the pandemic-related challenges faced by organizations and institutions worldwide, the AAS owes a considerable debt of gratitude to Greta for her outstanding leadership.



Greta Binford

Student Research Grant Awardees

The AAS awards research grants to deserving students. The deadline for applications is February 15th each year. Information can be found on the AAS website: <https://www.americanarachnology.org/society/grants/>.

The 2023 awardees were:

- Bradley Allendorfer, MS student, Eastern Michigan University. \$900. *Title:* Daily activity and site selection of Texas brown tarantulas (*Aphonopelma hentzi*) providing maternal care
- Tyler Brown, PhD student, University of Maryland, Baltimore County. \$771.63. *Title:* Phenology of Mid-Atlantic leiobunine Opiliones
- Patrick Casto, PhD student, Bowling Green State University. \$1000. *Title:* Analysis of cuticular compounds in the family Phrynidae (Arachnida: Amblypygi): implications for communication and navigation
- Jorjia Elmore, UG student, University of South Alabama. \$1000. *Title:* An exploration into sex-based venom variation in the Texas brown tarantula (*Aphonopelma hentzi*)
- Carolina Guerra, PhD student, Centro de Recursos Naturales Renovables de la Zona Semiárida (CONICET-UNS), ARGENTINA. \$1000. *Title:* Testing the effects of anthropization on *Allocosa alticeps*, a coastal wolf spider with atypical sexual strategies
- Asha Joy, PhD student, Christ College (Autonomous), Irinjalakuda, Thrissur, Kerala, INDIA. \$500. *Title:* Diversity and ecology of spiders associated with human habitations in the Western Ghats region of Kerala, India
- Nancy Lo Man Hung, PhD student, Universidade de Sao Paulo, BRAZIL. \$500. *Title:* Breaking unconscious gender biases: lessons from 26 years of Latin Arachnology Congresses
- Gia Ramos, UG student, Pennsylvania State University. \$1000. *Title:* Development of DIPA-CRISPR for reverse genetics studies in spiders
- Madison Rittinger, PhD student, University of Wisconsin, Milwaukee. \$1000. *Title:* Could smaller brains be better? The association between prey capture efficiency and relative brain size
- Muhammad Shahzad, MS student, University of Agriculture, Faisalabad, Punjab, PAKISTAN. \$525. *Title:* Collection and population dynamics of some predatory spiders of cotton crop from district Faisalabad, Pakistan
- Ryan Bacon, PhD student, University of Maryland, Baltimore County. \$1000. *Title:* UNAM collaboration for identification and description of tropical *Leiobunum*
- Nicolas Cazzaniga, PhD student, City University of New York & American Museum of Natural History. \$1000. *Title:* Blind to diversity: uncovering phylogeographic and climatic relationships in troglobite evolution
- Fabián García Oviedo, PhD student, Museu Paraense Emílio Goeldi, Universidade Federal do Pará, BRAZIL. \$1000. *Title:* The identity of *Falconina gracilis* (Keyserling, 1891) (Araneae: Corinnidae: Corinninae): is there a hidden cryptic diversity in this species?
- Tobias Hays, MS student, San Diego State University. \$800. *Title:* Systematics of the *Aliatypus erebus* group (Mygalomorphae, F. Antrodiaetidae)
- Emma Jochim, PhD student, University of California, Davis. \$1000. *Title:* Reevaluation of species boundaries in coastal dune trapdoor spider *Aptostichus simus* (Euctenizidae)

- Milda Riepšaitė, PhD student, Vilnius University, LITHUANIA. \$1000. *Title:* Improving knowledge gaps in Lithuania’s spider diversity and distribution through focused sampling
- Kongarampilly Shilpa, PhD student, Christ College (Autonomous), Irinjalakuda, Thrissur, Kerala, INDIA. \$1000. *Title:* Molecular taxonomy and phylogeny of the genus *Araneus* Clerck, 1757 and *Neoscona* Simon, 1864 (Araneae: Araneidae) in Western Ghats, India

Herb Levi Memorial Fund for Arachnological Research

The HLMFAR grants provide up to \$2,000 USD support to non-student AAS members (including post-docs) who receive little to no institutional support for their research programs. The deadline for applications is February 15th each year. Information about this funding can be found at:

<https://www.americanarachnology.org/society/grants/research-grants/>

In 2023, HLMFAR awardees were:

Angela Chuang of the University of Florida received a grant for “Estimating the range expansion and impacts of Jorō spiders on native orb weavers.”

Mariela Oviedo Diego of Instituto de Diversidad y Ecología Animal received a grant for “Rub or sting to match? Functional morphology and possible constraints between caudal and venom glands in bothriurid scorpions.”

Marc A. Milne, University of Indianapolis for “100 Years On: Replicating Bishop and Crosby’s Eastern US Spider Collection Trip.” See p. 10 of this newsletter for a report on this amazing research journey.

Insect Welfare Research Society Grant Opportunities

The Insect Welfare Research Society (IWRS) offers two different grants of \$2000 USD each to support graduate student research in Sentience or Welfare of under-studied invertebrate species. Applications are open with a deadline of October 30, 2023. The IWRS grant in Sentience aims to encourage graduate student scholars engaging in evidence-based, theoretically-grounded research on any aspect of insect or understudied invertebrate 1 sentience (subjective experiences). This award will be given to a graduate student whose research has the greatest potential to make a substantive contribution to our understanding of sentience in these taxonomic groups. The IWRS grant in welfare aims to encourage graduate student scholars engaging in evidence-based, theoretically-grounded research on any aspect of insect or understudied invertebrate welfare. This award will be given to a graduate student whose research has the greatest potential to make a substantive contribution to our understanding of welfare in these taxonomic groups in farmed, wild, or research contexts. Information and application material can be found at:

<https://www.insectwelfare.com/>.

***Spiders of North America: an identification manual* \$30 Sale ends soon!**

For a limited time ONLY, the American Arachnological Society is offering the 2nd edition of *Spiders of North America: an identification manual* (SNAIM) to AAS members for \$30 USD (previously offered to AAS members for \$50). This book retails to the general public for \$95. This offer is available only until October 31, 2023. Get copies of SNAIM for your courses! Gifts for your students! To take advantage of this offer:

- Go to <https://www.americanarachnology.org/society/members-area/>
- Login with your Username and Password Click on “Society Publications”
- Scroll down to *Spiders of North America* and follow the instructions to order your copies

You must be a member of AAS to take advantage of this limited time offer.

And, speaking of SNAIM, the editors have available copies of the 2nd printing of the 2nd edition with typos corrected and with the names of families back in the top margins. These new and improved versions of

SNAIM will be available once the remainders of the first printing (2nd edition) are all sold. And THAT will happen after readers take advantage of this incredible offer!

Interview with Yael Lubin

The *American Arachnology* editor, Paula E. Cushing, decided to continue interviewing well established arachnologists. Readers of the newsletter may remember past interviews with Jack O. Brookhart and Norman Horner. At the 2023 AAS meeting in Ithaca, New York, Paula (PEC below) interviewed Yael Lubin. Comments in brackets added by PEC.



PEC: Yael, how did you get involved in arachnology?

Yael: Well, first of all, I took a course in arachnology at the University of Florida. And this course was amazing. I'd just come down there. It was my first year of starting a PhD. Who was there? John McCrone, Jon Reiskind, John Anderson. Mike Robinson came up to do the behavior part of the course. Rainer Foelix came – he was a postdoc in Raleigh, North Carolina, with Peter Witt. This was a course with a bunch of teachers who were all the top in the field. Reiskind had just joined the faculty after being a graduate student at Harvard with Herb Levi. It was amazing. It was really interesting. But then I had decided that I wanted to do my PhD on termite ecology. I was fascinated by social species.

Then I went down to Panama for a summer internship. I'm scouting around for termites to work on them – I wanted to work on *Nasutitermes*. And I realized very quickly that what I wanted to do was really going to be difficult in the field. And the Robinsons were there and they were doing all this cool work on

predatory behavior of araneids, orb weavers. So I got interested in that and I slowly inched my way into spider research. I was getting some ideas what to do for my PhD and it was leaning more towards ecology.

I was living in a caravan out on Naos Island in Panama [in the Canal Zone], which belonged to the Smithsonian, to the Tropical Research Institute. And sharing it with a few other people. And it had been raining, a lot, just solid rain. Pouring down rain for several days. And this was late at night, pouring down rain, and we hear a pounding on the door. 'Police, open up! Police, open up!'

This caravan had two doors opposite each other. One door had a set of stairs going up to it; the other door didn't. The caravan was off the ground because it's wet so it was a half a meter or a meter up off the ground. So we open the door and there's nobody there and then we realize – it's like two o'clock in the morning, three in the morning, we were sound asleep – we open the other door and there's this gigantic policeman teetering on the wall. And he kind of falls into the caravan. And he then kind of pulls himself together and looks at us and says, 'Ma'am, did you lose an alligator?'

We said, 'Well, no.'

'Well, there's a big alligator out here and I figured you biologist guys, you musta lost it.' This is the Canal Zone so these were American police. And apparently this huge alligator had washed down from Gatun Lake or from the river alive and it was on the road, on the causeway. And he just reckoned, well, these Smithsonian people must own it and they've lost it.

PEC: As you do...

Yael: As you do, we always lose our alligators.

[After Panama,] I went back to Gainesville, did another semester, and sometime during the semester, I got a call from Mike Robinson saying, ‘Would you like to go to New Guinea as my research assistant?’ They had planned this extensive trip to Papua New Guinea via West Africa and India – all Smithsonian. The person who was going to be their research assistant was a student at Cornell who worked on birds – I don’t remember his name – he backed out at the last minute because he decided to get married. And it was sort of incompatible with going to New Guinea for two years. And I, of course, immediately said yes!

Oh, and the funny part was Mike and Barbara [Robinson] are, well he’s no longer alive, but they’re very British. In many ways very proper and in many other ways, not so. But Mike immediately said, ‘Well, give me your father’s telephone number so I can ask him whether it’s okay for his daughter to go to New Guinea.’ This was the end of 1968 or early 1969.

So then I had to quickly do my prelims...

PEC: So did your father give his permission?

Yael: I don’t know what my father said but I imagine that what he said was, ‘Well, if she wants to go to New Guinea, that’s fine. She’s independent.’

Once we were on the way, the first stop was Ghana. We spent a week there. And that’s where I encountered these big colonies of *Cyrtophora* and social behavior and colonial behavior. I was sold on that immediately. I found an even larger species, *Cyrtophora moluccensis*, in New Guinea. That was my PhD.

PEC: What were some of your best memories of that period of time in New Guinea, fieldwork, anything?

Yael: It was a complete learning experience. It’s not that I had been insulated or anything. I grew up in Israel, I came to the States to study, but what stuck with me... India, he spent almost a month in India, traveling all over the place. It was such an eye-opener. All these places, the culture, the people. I was just tagging along. Mike was on Smithsonian business. The idea was that he would talk to all these scientists and get [connections] with the Smithsonian going. It was fun traveling with him and Barbara. They both liked really good food, sampling all these interesting foods. There were a lot of funny incidents. India was particularly trying because at that time a westerner walking around the streets was immediately besieged by people everywhere, little kids begging. That was kind of a shock. And when we got to Australia, it was such a relief. I could just blend in and nobody’s going to notice me. We were in Sydney and suddenly you were just one of the crowd. You have to realize, I was in my mid-20s.

And then New Guinea was just totally amazing. All along, all the way, Mike was doing these feeding trials where he was looking at predatory behavior of different species. I thought, ‘Okay, I’m going to add *Cyrtophora citricola*. I’ll do the same thing with *Cyrtophora* and get an additional species.’

And then I saw the ones in New Guinea. These enormous colonies of these huge *Cyrtophora moluccensis*. I immediately knew that’s what I was going to work on. Look at the interactions among individuals and predation and parasitism. It was mostly natural history, I guess. But some experimental work. I didn’t really have much direction, I must say.

PEC: Were you based at a station in New Guinea?

Yael: Yes. At the time it was the field station of the Bishop Museum of Hawaii. And the person who had established the field station was up in the mountains, above a village called Wau. In the Wau Valley and Gressitt, Lin [Linsley] Gressitt from the Bishop Museum – a famous entomologist – had established this station. And he and his wife came and they were there for a period of time while I was there. Unfortunately, they were killed in a plane accident in China sometime during that period [1982].

So, the first visit I was there – because I went there twice, 10 years apart – [doing] my postdoc as well. First time I was there it was this field station with the museum and then Papua New Guinea became independent. The station kind of became nationalized you could say so it became the Wau Ecology Institute and had a board of directors of some local people from the University of Papua New Guinea and still from the Bishop

Museum. It was a very interesting crowd; people coming through. So that time when I was doing my PhD, there was a mammologist, a Pakistani mammologist and his family – Abid Beg Mirza – a very colorful character.

And one of the amazing things we did was, they'd just opened up the Star Mountains – that's over towards the Irian Jaya part, a very remote area. They'd just opened up that area to westerners because they were scouting for mining and whatnot. We flew in there with Abid and a few other people and walked up into the mountains, into a pretty remote village where most of them had not seen a white person. And he [Abid] was collecting mammals and I was doing spider stuff. But one really funny thing – on that walk in, it was a couple days' walk, there was this guy coming down the path, and you have to remember, this was 1969. This young guy comes down the path. He's got a transistor radio and he stops and talks to us in English, which is unusual to begin with. He was a school teacher and he said, 'Where are you from?' I said, 'The US.' And he said, 'Oh, you just put a man on the moon!' It was the moon landing!

PEC: And he knew it before you did!

Yael: And we were in tropical forest, montane forest in the middle of nowhere, and we had flown in from...it was just... I must have dreamt that up!

In the middle of this village there was an enormous colony of *Cyrtophora moluccensis* and it was their [the villagers] fly trap. I think they'd moved the spiders because it was a lone tree in the middle of this very open area with huts around it.

PEC: Tell me a little bit about the students who have gotten training from you and the people who have gotten training from you.

Yael: Well, I didn't actually start my teaching career until I was about 40 years old because I was on all these research grants. And the first real position I ever had was when I went back to Israel in 1984. So all of the students that I mentored were the students that I had in Israel. And, actually, when I officially had retired, we sort of had a little party only it turned out to be a big party because what I did was I just invited all my former students and technicians and people who'd worked for me. And I thought, 'Yeah, okay, it'll be about 20 people.' It was a crowd! It was really a crowd. I didn't invite the staff or faculty. It was just students and technicians. And it was a big surprise to me that so many had gone through [my lab]. It included postdocs, too. Out of that group of actual students, I would say only two continued in arachnology – Efrat [Gavish-Regev] and Mor Salomon, who works in the Agricultural Research Institute.

Postdocs are different – like Mary Whitehouse is in Australia and she works also in agriculture but does some work with spiders. And Jutta Schneider and Trina Bilde. So, yeah, they've continued in arachnology.

Most of the students, master's students, went on to do other things. I haven't had that many PhD students. Some of them went on into academic positions but kind of diverged out like Michal Segoli, who's on our faculty now [at Ben-Gurion]. [He] worked on parasitoids and now we collaborate.

So, yeah, it's been very productive and very fruitful but it's all from that 1984 period. Before that, I had these research positions.

PEC: But you've had a lot of collaborators over the years.

Yael: Yeah, I have. A lot of that is because of all these collaborative research programs with groups in Europe. There was a joint program with the Czech Republic and with Germany. I've been able to invite researchers to come and collaborate. And that's been a lot of fun. It's been great.

PEC: And what an influence on the students, too, to meet so many people.

Yael: Yeah, and we have an international group of students from all over the place – it's about 50% Israeli and 50% from all over the world. A lot of students from Africa and Asia. Everything's in English. It's a really good program – that's the graduate program.

PEC: You've traveled beyond New Guinea to do fieldwork? Or has most of your fieldwork since New Guinea been focused in Israel?

Yael: So I was in New Guinea twice, with 10 years in between. And those 10 years in between, a fair portion of that time was not working on spiders, actually. I did all that work on anteaters, on neotropical anteaters and their prey. I had some side projects on spiders. I did some work on *Philoponella* during that period when I was in Panama. But the focus was this big project on predator-prey interactions between anteaters and their prey, which were ants and termites. And then I went back to New Guinea and did the social spider work for the two years, working on the true social spiders – *Achaearanea*, which is now something else [*Parasteatoda wau*]. That's a true social spider.

And then, I went to the Galapagos for two years and looked at the effect of the introduced *Wasmannia* fire ant on the native invertebrate fauna, including spiders.

PEC: And was that your funding?

Yael: That was from the Charles Darwin Research Station. I went as a research scientist.

And then I went to Israel and from there, the work focused on Israel and southern Africa.

PEC: From your perspective, how has the field of arachnology changed since you got involved?

Yael: Wow! First of all, it's blossomed. There's no question about it. Social spiders, social group-living spiders [research] community has grown tremendously. A lot of women got into that field – Jutta Schneider, Trine Bilde and all her students and our joint students; we had students together. In the beginning, it was really... George [Uetz in his keynote address during this conference] was wrong! It was Ruth Buskirk and me. And she worked in Costa Rica and I worked in New Guinea and when we met up in Warrensburg [first AAS meeting in 1975 in Warrensburg, Missouri USA], we were both just finishing our PhDs. And we had done very similar things. Independently. No email then. It was just wonderful, 'Hey, I did that, too! I got that result, too!'

PEC: I haven't heard about her [Ruth Buskirk] for years. Did she get out of academia?

Yael: I tried to contact her a little while ago and then somebody told me that she's more in education now and maybe she never saw my email. Yeah, she's not doing research in biology anymore. [Note from PEC – Ruth Buskirk is a lecturer at the University of Texas at Austin now.]

Then a whole bunch of people joined in. I think George [Uetz] was kind of the outlier because it was mostly women. George and then Fritz Vollrath was also working in Panama on social spiders.

You know, because I kind of dabbled in different fields and different aspects of spider research...I haven't focused on just social spiders or, like George, on two systems in sexual selection and communication in social spiders. I've kind of dabbled in a whole lot of different fields – some work on spiders in agriculture, a lot of biodiversity stuff – big biodiversity project in Israel that sort of covered all different habitats the length of the country. I was one of the instigators of that project.

I think I was telling you, a lot of people are interested in arachnids and in arachnology and when we had these meetings in Israel, something like 70 people show up for the bi-annual meeting. So we've gotten a lot of people interested but not necessarily following up in research positions.

But I see that in Europe, there are a lot of young people in the field and in the States. It's wonderful. It's great – and so many different directions, too. And, unfortunately, there are also these fads. So, like sexual selection was a big fad for a while. And community ecology was a big fad for a while.

PEC: What advice would you give to up-and-coming young scientists?

Yael: Just find an interesting question. Pick out a group that looks like you can get some answers. Or, and this is something that we're told not to do, pick out a group that you like and then find the questions! We are told that that is incorrect. That you have to have a question first and pick the group. And this is what

they tell all the students in my department. But, you know, you have your preferences. And especially once you get to know a group of organisms – whether in my case it was social spiders or colonial spiders – the questions come. And the hypotheses generate themselves without even having to go to the books. Obviously, you do have to read the papers.

PEC: What other memories? Field memories or people you've met or people who've influenced you?

Yael: You know, a great influence was actually Herb Levi. And it's not that I spent a lot of time with him. It's just that I think I was always so impressed with his dedication. His enthusiasm for, not just taxonomy but spiders in general. And his desire to impart that enthusiasm to other people. He was a big influence on me.

He came to New Guinea while we were there on the second trip. The second trip was also with Mike and Barbara [Robinson]. I was already doing a postdoc. He came with us. We stopped first in Australia, we were in Sydney, for a few days. And, you know, he had this strong German accent. We went into a bar to get something to drink. Herb turns to the barman and says in his strong accent, 'May I have a coke?' The barman looks at him quizzically and he sort of rummages around under the bar and he pulls out a cork!

Oh, and the other Herb Levi story from that field trip – he was very proud of his collecting technique. His collecting technique was to locate the spider he wanted to collect and then he says in his deep voice, 'And what I do is I put my hand underneath and I go...' and he pushed his hands together. I always wondered how many spiders did he squash by doing that? Clapping his hands together!

A lot of really nice field experiences [like] the work in Namibia was just wonderful. This was with Trine and her students and my students. The social spider work was just phenomenal, great fun. We spent a lot of time together in the field and did a lot of really cool things I think.

PEC: A lot of good research came out of it?

Yael: Yeah, yeah and before that with Jutta as a postdoc, that was really very special. Also with Mary Whitehouse. I had some really special postdocs and some special students as well. Really challenging and bright and they challenge your thinking. With Jutta, she came to Israel on her motorbike. She drove her bike down through Germany, through Greece, put it on a ferry. She did this twice. And landed in Haifa Port and drove it all the way down to the desert and then used it for fieldwork. And I'd hear her waking up with a loud vrrmmm at five o'clock in the morning. And I'd take my bicycle.

PEC: Did you ever get on the back with her?

Yael: A couple of times. I'm not keen on that.

So when she was there, that's when we found that the males steal the female's eggsac and throw it out [of *Stegodyphus lineatus*]. Basically commit infanticide. And then they mate with the female.

PEC: Like a lion.

Yael: Exactly. I mean, the only cases that were known up until then were lions and langurs, I think. Some mammals. That was a *Science* paper. That was really exciting. [PEC note: actually it was a *Nature* paper: Schneider J & Lubin Y (1996) Infanticidal male eresid spiders. *Nature* 381: 655-656, <https://doi.org/10.1038/381655a0>]

We had marked females in the field that we were tracking, seeing when they produced an eggsac, and the young hatched, and getting the whole life history and Jutta [Schneider] was going out every morning and checking them and she came back one morning and said, 'You know, there are several females there that had an eggsac yesterday or the day before and suddenly there's no eggsac.'

I said, 'Well, that's a bit strange.'

'And,' [Jutta said] there's a male.'

So I went out with here and looked on the ground and there were the eggsacs on the ground and the male was in the nest with the female and then she produced another eggsac. But, you know, they're semeparous and they have matriphagy so the female only reproduces once in her lifetime so that's the only way the male could have gotten the paternity.

PEC: That's extraordinary.

Yael: Yes, it was. And then we did some experiments in the lab to see how both of them could get damaged.

PEC: The males fight with the female?

Yael: Yeah, to get the eggsac away. There's a real battle. And sometimes she kills the male and sometimes the male bites her.

Centennial Reenactment of the 1923 Crosby & Bishop Southeastern Spider Expedition

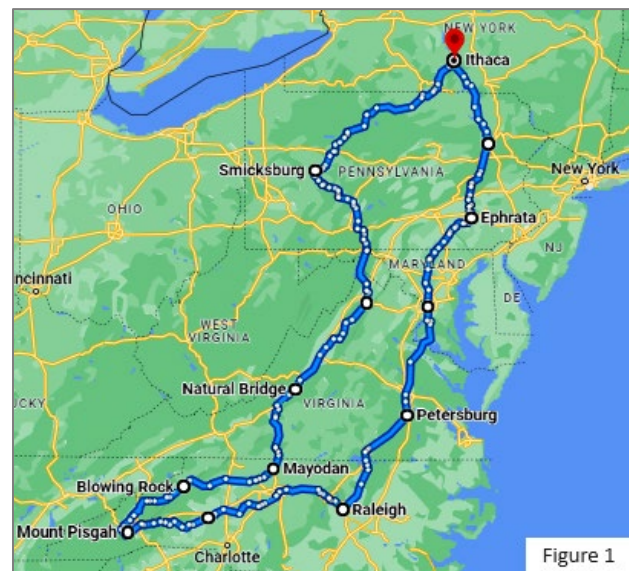
By Marc A. Milne, Nina Sandlin, and Michael L. Draney

Cyrus R. Crosby (1879-1937) and his junior colleague Sherman C. Bishop (1887-1951) were major contributors in the early 20th century to the taxonomy of North American Linyphiidae (Bonnet 1968) – the family that the three of us focus on. Crosby's academic home was Cornell University; Bishop studied at Cornell, and was a professor at nearby University of Rochester. In October of 1923, the two men undertook a remarkable month-long collecting expedition to the southeastern United States. The fruits of this trip appeared again and again in taxonomic studies the two published with great regularity during the next decade (Bishop & Crosby 1926, 1930, 1934, 1935a, 1935b, 1938; Crosby & Bishop 1925a, 1925b, 1927, 1933b).

Although they briefly mentioned this trip (in Bishop & Crosby 1926, Crosby & Bishop 1925a), they never published a complete scientific account of their travels in the vein of Chamberlin and Ivie's (1944) summary of a collecting trip in the "Georgia region." And, like most professors of their era, they left few traces of themselves, a century on, beyond their scholarly publications. But in exploring the Crosby archive at Cornell, Marc Milne found a journal that detailed the trip written by Crosby's wife Nellie who, along with Sherman's wife Alice, accompanied them. So when we learned that the American Arachnological Society's 2023 annual meeting would be held at Cornell, Marc hit upon a "centennial reenactment" of the trip as a striking way to commemorate the efforts of these two men. The society's Research Grant program generously provided Marc with the funding for us to carry out this memorial collecting trip. (*For photographic journey of our trip, see our StoryMap: bit.ly/CandB100*)

Nellie's journal gives a fairly detailed daily account of the journey, mentioning their stopping points and memorable locations such as caves and the better inns they occasionally stayed at. We thus know the approximate route they took south from Ithaca through southern New York, Pennsylvania, and Maryland to Virginia, then into the highlands of North Carolina (Fig. 1) – and that they traveled mostly on dirt roads in a single automobile, usually camping and cooking their own food along the way.

But Nellie and Alice were not involved in the scientific side of the trip, and the journal does not detail where and how the spider collecting happened. Not being able to revisit their exact sampling sites – many of which presumably no longer exist – we selected sites along the route we were retracing that seemed promising for our



purpose. Being primarily interested in finding rarely collected linyphiids, we tried to search out well-preserved and well-managed examples of habitats likely to harbor a diversity of them. We were looking for forests that were mature to old and that had deep leaf litter, and also for open habitats that were mesic to hydric, since most linyphiids prefer more humid situations. We looked and asked around for wetlands of all sorts (with and without peat), wet meadows, and wet prairie remnants.

Marc's list of the taxa collected during the 1923 trip that were mentioned in their works comprised 91 species in 19 families, including at least 12 species new to science and numerous revisions. One of these was the now federally endangered Spruce Fir Moss Spider, *Microhexura montivaga* (Microhexuridae). Clearly, one scientific reason to repeat their collecting route was to determine what proportion of their taxa we would be able to recover a century later. We also were curious as to what taxa we might find that they did not report. Records of at least 24 linyphiid species resulted from their 1923 trip, including five described by them. Among these is *Goneatara eranistes*, a "ghost" species that was collected once in the small town of Alberta, Virginia, in 1923 and has not been collected since then. Marc had repeatedly searched the region (and collections continent-wide) for specimens without success, and we hoped that revisiting Crosby and Bishop's original route with modern collecting equipment might at last turn some up. Among the 12 species are also four that lack either a male or female (or in one case, *Ceratinopsis bicolor*, adults of either sex!), so another goal was to try to find mates for these and other single-sex taxa.

We could afford about eight days for the trip, rather than the month that they had spent. Still, we were able to retrace quite a bit of their journey. We were traveling faster, on better roads, and it was easier for us to find and set up our campsites, as we stayed at state parks and generally places with amenities such as water (and, if we were lucky, electricity and bathroom facilities). We had decided to skip the North Carolina leg of the original trip, as the Great Smoky Mountains National Park area (where they collected, before the park was established) is currently being thoroughly sampled for arachnids by Michael Caterino's lab at Clemson University.

We had originally planned to drive Marc's Toyota Prius Prime, but as we loaded supplies and equipment, we realized that there was barely had enough room for three travelers with all our camping and collecting gear. We ended up taking Mike's Subaru Outback, outfitted with a large vinyl luggage carrier on the roof (thanks to the AAS grant; Fig. 2). After an enjoyable and memorable AAS meeting, we started our expedition on the day of the AAS field trips, collecting south of Ithaca and making our first camp at Buttermilk State Park.

From there, we retraced most of the northern section of the 1923 trip through east-central Pennsylvania (2 nights). We generally tried to find one or two locations per day where we could obtain permission to collect either in between or at campsites.



Marc Milne, Nina Sandlin, and Mike Draney.

We're not sure what vehicle the Crosbys and Bishops drove in 1923, but we know it wasn't fast. We could've easily driven from our northernmost point to our southernmost in less than a day. By contrast, on days where they didn't sample and drove constantly, they topped out at 183 miles. They also had to contend with quality of the roads. One day, Nellie remarked, "We had the most slippery clay road as had yet found – then came fine sand." Our asphalt roads would've been amazing to them!

With a limited amount of time to sample each site, we focused first on the most promising habitats and microhabitats, using three main methods: vacuum sampling; sifting of concentrated leaf litter, and sweep nets, bolstered by occasional use of beating and brushing vegetation and trees/rock surfaces; and visual search with aspirators. For vacuum sampling, we used a Black and Decker [Model No. LSWV36, Type 2,

40V] leaf blower switched in reverse, and modified with a sampling bag manufactured by Watkins and Doncaster [Product ID: E668]. The unit was powered with a battery that we charged while traveling. This device, which Crosby and Bishop would have loved and greatly benefitted from, is especially useful for extracting spiders from bare ground (especially from within mud cracks in wetlands), from grass and sedge tussocks, and from peat and other mosses. We mainly used the sweep nets for low vegetation in open habitats such as marshes, wet meadows, and prairie remnants. Forests were mostly sampled by the laborious but effective method of field-sifting concentrated leaf litter (using the litter concentrator manufactured by BioQuip).

Our route took us past Gettysburg – where the Crosbys and Bishops ate lunch on Culp’s Hill – and into Maryland (1 night), where we collected and camped at the Chesapeake and Ohio Canal National Historical Park. Parts of the canal now form an interesting wetland complex. Then, two nights in Virginia, with our southernmost point a bit south of Richmond at a relict powerline wetland (Cherry Orchard Bog State Natural Area).

Our regular nightly activity was reading Nellie’s journal aloud, deciphering Nellie’s cursive script and decoding some early 20th century idioms, and discussing her stories. The journal made us keenly aware of how easy we had it in our modern car and with reservations each night to camp. Their roads were mostly unpaved and quite dusty that autumn – and sometimes frightening, with “blind curves,” in the mountains; she called the new National Highway “frightful.” No doubt our traffic was worse, but Nellie even complained about passing “numberless cars along the road.” The journal is filled with fascinating, detailed observations, such as the fact that their car weighed 2,940 pounds, loaded, or that at the Fredericksburg battlefield, which they visited, the picket lines had been 75 feet apart. Nellie was curious about the south, drawing pictures of tobacco wagons and curing sheds, and trying to re-create colorful local language phonetically (“I always wanted to saw that, but I never did sawn it.”). She noticed, as we did, the environmental degradation in Pennsylvania caused by mining; at one point, she notes pools in a stream “black with coal dust.” We also saw river rocks apparently discolored by mining activity, as she had observed. But the most sobering part of the diary were Nellie’s matter-of-fact descriptions of 1920s race relations in the south. Things there were apparently very different than what she experienced in New York, but she mostly uncritically described, rather than commented on, a social system that we find abhorrent today.

The Fourth of July was spent in a very nice campground at Pocahontas State Park, in a yurt rather than our tents. On our last day in Virginia, July 5th, we collected at an extraordinary Shenandoah Valley prairie/fen site (Cowbane Prairie State Natural Area; Fig. 3), before leaving the 1923 trail and heading west. We ate dinner at a Mexican restaurant in Belle, West Virginia, for Mike’s birthday. That night, we finished Nellie’s 35-page journal (Mike, who kept our reenactment journal, detailed our 8 days in 23 pages). On the way back to the Midwest, we hit one final site, Vinton Furnace State Forest in the Appalachian foothills of southern Ohio.



We are working our way through determining the large amount of material resulting from 41 samples collected from 12 natural areas in five states. No doubt we failed to recover many of the species that Crosby and Bishop turned up in 1923. This seems like a depressing result, related to degradation of habitats during the last century, but we also have to report the optimistic fact that we are turning up numerous native taxa that Bishop and Crosby did not find, including (so far) 21 state records. We hope to publish our findings once the work is completed.

For many photos and more of Nellie’s observations, see the StoryMap of our trip: bit.ly/CandB100

We are grateful to everyone who made this “centennial reenactment” of Crosby & Bishop’s 1923 trip possible. In particular we would like to thank the American Arachnological Society and its Herb Levi Memorial Fund for Arachnological Research grant selection committee for funding, support and enthusiasm; Steve Roble and the Virginia Department of Conservation and Recreation for collection permits and help with site selection, as well as joining us in the field; Andrew Landsman and the National Park Service for collection permits and help with site selection. Finally, special thanks to the Cornell Rare and Manuscript Collections for access to Nellie Crosby’s journal, without which this reenactment could not have taken place.

Literature Cited

Bonnet, P. *Bibliographia Araneorum. Analyse méthodique de toute la littérature Aranéologique jusqu’en 1939. Tome 1.* Noble Offset Printers, Inc. pp. 57-58.

Bishop, S. C. & Crosby, C. R. **1926.** Notes on the spiders of the southeastern United States with descriptions of new species. *Journal of the Elisha Mitchell Scientific Society* 41: 163-212, pl. 20-25.

Bishop, S. C. & C. R. Crosby. 1930. Studies in American spiders: genera *Ceratinopsis*, *Ceratinopsidis* and *Tutaibo*. *Journal of the New York Entomological Society* 38: 15-33.

Bishop, S. C. & C. R. Crosby. 1934. Studies in American spiders, the genus *Wubana*. *Journal of the New York Entomological Society* 42(2): 215-219.

Bishop, S. C. & C. R. Crosby. 1935a. A new genus and two new species of Dictynidae (Araneae). *Proceedings of the Biological Society of Washington* 48: 45-48.

Bishop, S. C. & C. R. Crosby. 1935b. American Erigoneae: the spider genera *Pelecopsidis* and *Floricomus*. *Journal of the New York Entomological Society* 43: 31-46.

Bishop, S. C. & C. R. Crosby. 1938. Studies in American spiders: Miscellaneous genera of Erigoneae, Part II. *Journal of the New York Entomological Society* 46: 55-107.

Crosby, C. R. & Bishop, S. C. 1925a. Two new spiders from the Blue Ridge Mountains of North Carolina. *Entomological News* 36: 142-146.

Crosby, C. R. and S. C. Bishop. 1925b. Studies in New York spiders. Genera: *Ceratinella* and *Ceraticelus*. *New York State Museum Bulletin* 264: 1-71, pl. 1-12.

Crosby, C. R. and S. C. Bishop. 1927. New species of Erigoneae and Theridiidae. *Journal of the New York Entomological Society* 35: 147-154.

Crosby, C. R. and S. C. Bishop. 1933. American spiders: Erigoneae, males with cephalic pits. *Annals of the Entomological Society of America* 26(1): 105-172, pl. 1-10. doi:10.1093/aesa/26.1.105

More Accurate Use of the Terms Venomous, Poisonous, and Toxic

By Rick Vetter

I would like to present an issue where improvement of terminology can be made in the area of arachnid toxinology. I have seen multiple publications by arachnologists and toxinologists where they use the term "venomous spider" to describe a spider whose venom has strong deleterious effects on humans. Included here would also be "highly venomous" and "most venomous". I feel that this is an inaccurate use of the term similar to when a journalist identifies a spider as an insect. I would like to present an argument that it is possible for more accurate use of terminology and I hope to convince people to consider the following.

Venomous - is an anatomical description of an animal that has venom glands, venom ducts to convey the venom to a hardened structure (sting or fangs) for the purpose of hypodermic injection of venom into a target organism. In and of itself, "venomous" does not connote deleterious effect. It depends on the reaction of the target receiving the venom. Almost all spiders have venom glands, venom ducts and fangs. Therefore, almost all spiders are venomous and to say "venomous spider" is 99% of the time a redundancy;

probably 100% for "venomous scorpions". However, very few spiders have venom that affect humans. Cobras are venomous because they have the anatomical equipment. They have detrimental effects in humans when they bite so they are toxic to humans. In contrast, to a mongoose, cobras are lunch because mongoose (mongeese?) are immune to the venom effects and they eat the snakes.

Poisonous - is an anatomical description of an animal, plant or is a chemical that can cause detrimental effects in some target organism. In animals, there are poison glands but no ducts or hardened injection structures. The poison is exuded from the glands or may be permeated in body tissues. Administration of a poison is through topical application or ingestion or rarely squirting. Poisonous things are poison arrow frogs, deadly nightshade, jimson weed, pesticides and mercury. Poison oak causes a toxic topical reaction in many humans but deer eat the leaves with no ill effect.

Toxic - The word that connotes effect in a target organism is "toxic". A brown recluse is venomous and has a venom that is toxic to humans. There are several mygalomorph spiders in Australia whose bites are deadly to dogs but have little effect in humans. The Sydney funnel web spider is extremely toxic to primates but not other mammals. There are many venomous creatures (e.g., tiny parasitic wasps) that are not toxic to humans because they have no effect during a bite or sting.

So the proper terminology would be "a spider with venom toxic to humans" which is wordy. "Toxic spider" is shorter but doesn't tell you if it is toxic through bites or it could be toxic through ingestion. I realize there is room for improvement in what I present here but I think if we can limit the use of "venomous spider" when we mean "toxic", the use of terminology improves.

AAS Discount for *Spiders of India*

Siddharth Kulkarni (sskspider@gmail.com) is offering AAS members a 25% discount for *A Field Guide to the Spider Genera of India*. To take advantage of this generous offer, go to <https://sskspider.com/book/>, click on the "AAS members only" item and place your order. Complete the order by paying \$60 USD via PayPal to kulsiddy@gmail.com. Send any questions about this offer to spiderbook@sskspider.com.

Bound Issues of JoA Available

Ken Prestwich (former AAS webmaster) is offering a hard-bound set of all issues of the *Journal of Arachnology* from issue #1 (1975) through issue #33 (2005). Own a piece of arachnology history! These were the very issues that Ken scanned to create the online volumes available via the AAS website. Anyone interested and willing to pay for shipping (book rate) or willing to visit Ken in person to pick them up is welcome to these volumes. Contact Ken at kprestwi@holycross.edu.

Arácnido Website

Arácnido is a relatively new website dedicated to taxonomic data and systematics in arachnology. This site (<https://www.aracnidotaxonomy.com/>) has transitioned from social media outlets to a website solely dedicated to providing the scientific community and citizen scientists alike with timely scientific publication updates as they relate to taxonomic changes in both the orders of Araneae as well as Scorpiones. The site is managed by Luis A. Roque (lroque@aracnidotaxomy.com). The website emphasizes the infraorder mygalomorph in Araneae, as well as all publications related to Venomics. Tabs make navigating and finding related publications easier. Please make sure that you share this information with other colleagues and friends so that they can also access the site at their leisure. Please note that you can follow either with an RSS feeder application or by simply clicking on "Follow"; these are both located on the right-hand side of the panel on the site's home page.

Ecdysis: a Data Portal for Live-Data Arthropod Collections

The Denver Museum of Nature & Science arachnology data has been moved from SCAN Symbiota to Ecdysis: a portal for live-data arthropod collections. The URL for this fantastic arthropod data portal is <https://ecdysis.org/>. Ecdysis includes data from well over 100 arthropod collections. Our data is also pushed

out to Global Biodiversity Information Facility (<https://www.gbif.org/>). Thus, there are many ways to access our data if you are interested in reviewing our holdings and/or requesting loans. The SCAN Symbiota database still exists for the time being but we are not actively entering new data into SCAN – just into Ecdysis – then pushing snapshots back into SCAN periodically. Through Ecdysis, you can also access an ever-expanding online Camel Spiders of North America fieldguide including diagnostic images: <https://ecdysis.org/checklists/checklist.php?clid=12176&pid=0>.

Advice and Wisdom from George Uetz’s Keynote Address, June 2023, Cornell University

- Any spider can be a “model” species; everything we learn is new
 - *Schizocosa*, *Metepeira*, *Latrodectus*, *Parasteatoda*, *Cupiennius*, *Trichonephila*, *Anelosimus*, *Habronattus* – a growing list...
 - Krogh’s principle – for every question there is a species to provide the answer
- Never underestimate the importance of random discoveries
 - A side project can become a whole new line of research
 - New questions can bring new insights
- Technology can enable as well as limit research
 - Be careful which rabbit hole you dive into
 - “omics” are powerful tools but not all there is...
 - Statistics do not have to be complex to provide answers
- Scientific research questions and techniques can be trendy
 - You don’t have to be a *fashionista* to do good science
- Don’t forget you have a home in Arachnology
 - The AAS has always been a welcoming and inclusive scientific community

“From a different point of view”

The 1977 meeting of the American Arachnological Society was held at Western Carolina University in Cullowhee, NC. At the conclusion of the meeting, there was a field trip where we got to go up into the Great Smoky Mountains National Park, and I looked forward to seeing those magnificent mountains. On the day of the trip, Al Cady and I had arrived late, and the only seats left in the university vehicles were the rear-facing seats of a station wagon. We were disgruntled to say the least, as not only were those seats uncomfortable for us long-legged arachnologists, but we had to ride facing backwards the whole trip. However, as time passed, and we ascended the roads into the mountains, our seemingly backward seats afforded an ever-expanding view of the valleys below and the mountains in the distance. As we climbed higher and higher, the view widened, and a panoramic vista of the magnificent Appalachian landscape unfolded before us. By the time we reached our destination, we were awestruck at the notion of how much beauty we would have missed had we taken a front facing seat. As I have grown older, and find myself looking back, I regard this experience as a true metaphor for life, and the unexpected perspective that can only come with the passage of time.