American Arachnology

Newsletter of the American Arachnological Society

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In This Issue...

Future A.A.S. Annual Meeting Sites

2008 — UC Berkeley, Berkeley, CA
25 June — 30 June
2009 — Arkansas Tech, Russellville, Arkansas
2010 — TBA
2011 — Lewis & Clark College, Portland. Oregon
2012 — U Wisconsin — Green Bay

2008 AAS Annual Meeting

University of California

Berkeley California

Wednesday, 25 June – Monday, 30 June

hosted by

Rosemary Gillespie &

Charles Griswold

Report from the 31st Annual A.A.S. Meeting Susquehanna Univ., Selinsgrove, PA 13-17 July 2007

hosted by

Dr. Matt Persons

The 2007 AAS meeting was meticulously planned and executed by our hard-working host at Susquehanna University in Selinsgrove, PA. All in attendance agreed that it was an informative, relaxed, and entertaining meeting that provided many opportunities for arachnologists to confer, learn, and socialize. Matt and his crew deserve a heartfelt "**Thanks & Well Done!**".

Full report on Page 2...

REMINDER !!!!

REGISTRATION AND ABSTRACT SUBMISSION DEADLINE IS MONDAY 19 MAY

REGISTER FOR THE 2008 MEETING AT:

http://www.americanarachnology.org/AAS_Meetings/index.html

Report from the 31st Annual AAS Meeting Susquehanna University Selinsgrove, PA July 13-17 2007

hosted by Matt Persons

The 31st Annual American Arachnological Society Meeting was held in the fine little borough of Selinsgrove deep in the heart of central Pennsylvania and the Susquehanna Valley. The meeting kicked off with 110 registrants from throughout the USA as well as Canada and South Korea. A relaxing BBQ social set the tone Friday evening. Saturday jump started the first day of talks with an 8:00am welcome by Susquehanna University President, L. Jay Lemons. The morning included two oral presentation sessions covering Ecology and Behavior followed by a group photo of attendees on the steps of historic Seibert Hall. The afternoon featured a poster session in Lore Degenstein Art Gallery. Well-placed lighting, fine hors de' oeuvres, and plenty of mingling space made for a fine atmosphere for posters. The evening included a causal night with arachnids as well as several talks sponsored by the affable yet stalwart AAAFF (Arachnological Association for the Absorption of Federal Funds).

Sunday featured oral presentations on evolution and systematics as well as behavior. Needless to say lycosids were well-represented in the latter group of talks. Sunday afternoon was open allowing time for well-attended kayak trips down the Susquehanna River (over 30 showed up and the weather was good). The executive committee met Sunday night and a free "Taste of Pennsylvania" dining experience was offered in the evening. It was the opinion of the host that experimental Pennsylvania cuisine such as chicken and waffles, and shoe-fly pie should not incur financial obligations to the naïve palate.

Monday was a full day of talks with morning sessions in functional morphology and physiology, and behavior. A session of talks in the afternoon preceded the business meeting. A silent and live auction along with student awards concluded the day. Before the night was over, George Uetz and his side men was cajoled to sing a fine rendition of "Music sex and cookies" for Society financial gain. The field trip included travel to Tall Timbers National Natural Landmark for some good collecting in an old growth hemlock forest. Bruce Cutler and Charles Bier were on hand to lend their taxonomic expertise along with the usual assortment of functional morphologists, taxonomically-impaired behavioral ecologists, and others.

A hearty thanks to Maggie Gardner, Jamie Havrilak, Beth Lawrence, Kristen Shimmel, Alex Sweger, Becky Holler, and Lee Bobbie for their hard work organizing the meeting, manning the registration table and working feverishly behind the scenes. Additional thanks go to Ken Prestwich who streamlined the registration process and helped organize abstracts. Rick Vetter, Beth Jakob, Paula Cushing, and Nancy Kreiter all were good advisors, mentors, and therapists for the meeting.

2007 Meeting Field Trip Report

Many thanks to **Bruce Cutler** for providing us with this report about the Field trip:

On a delightful Tuesday, July 17th, ten dedicated arachnologists departed from the Susquehanna University campus for the Appalachian Mountains. Our destination was the Snyder-Middleswarth Natural Area in Bald Eagle State Forest. The site is a beautiful scenic tract characterized by pine and some hemlock, with some hardwoods as well, including virgin stands of white pine, pitch pine, and hemlock.

Trails bordering Swift Run, a classic mountain stream tumbling over a rocky bed, provided access to the closed forest environment. Because of the habitat and elevation the weather was very pleasant, with moderate temperatures although it was high summer. Matt Persons noted that the stream was low because of a continuing drought, and parts of the trails that were quite dry are normally very muddy. July is the "growing season" in the northeast, essentially all spiders collected were immature. *Pardosa* were common running over the rocks at the stream edge, and sweeping produced predominantly immature araneids, *Leucauge*, linyphiids, *Tetragnatha*, and theridiids. Small numbers of *Philodromus*, salticids and thomisids were also uncovered. On bridges spanning the stream and under logs nearby, agelenids and amaurobiids occurred. By far the most interesting objects were hundreds of *Theridiosoma gemmosum* egg sacs on logs and rocks adjacent to the stream. On one cut surface of a large log about 1 m in diameter I counted over 40 egg sacs. Despite searching, no *Theridiosoma* were found, nor did they turn up in sweeping. Some of the egg sacs collected were later found to be viable. For someone interested in this species, definitely a site to consider.

Abstracts of Symposium, Poster and, Oral Presentations-
31st AAS Meeting, Selinsgrove, PA
17 - 21 June, 2006

Podium Presentation Abstracts

*** *designates student competition entry; presenter in bold**

Molecular insights into social structure and evolution of sociality in *Anelosimus* (Theridiidae)

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While spider sociality is scattered across ~13 tiny clades (1-2 spp each) in the order, roughly half of all social species are concentrated in a single clade; the cobweb spider genus *Anelosimus*. Morphological phylogenetic work to date has suggested that even within *Anelosimus* sociality similarly has evolved repeatedly. This suggests that at both taxonomic levels the same pattern holds: multiple origins of sociality but low diversification of lineages once social. Interestingly, each time sociality arises, it is accompanied by a switch to inbreeding and results in strikingly similar social structure. Here, we address several questions surrounding sociality and its evolution using molecular data. We find that the molecular data agrees well with the morphological phylogeny, confirming multiple independent origins of sociality. Within the social *A. eximius* we see a pattern of colony propagation by single matrilineages and absence of colony mixing, suggesting faithful inbreeding within colonies. Across species we find evidence of the consequences of sociality on population genetic patterns. Social species show lowered sequence divergence both in mitochondrial and nuclear data as compared to the outbred subsocial species. This suggests that inbreeding and other consequences of sociality, such as high turnover and small effective populations sizes, lead to loss of genetic variability. If genetic variation is the basis of evolutionary potential of species to respond to environmental change and disease, then lowered genetic diversity in the inbred social spiders may help explain their low diversification and relatively brief persistence in evolutionary time.

Family ties: molecular phylogeny of crab spiders (Araneae: Thomisidae)

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The first quantitative phylogenetic analysis of three sequenced genes (16S, CO1, H3) of 25 genera of crab spiders and 11 outgroups supports the monophyly of Thomisidae. Four lineages within Thomisidae are recovered. They are informally named here as the *Borboropactus* clade, *Epidius* clade, *Stephanopis* clade and the Thomisinae clade, pending detailed morphology based cladistic work. The Thomisinae clade is recovered as a strongly supported monophyletic group with a minimal genetic divergence. Philodromidae previously widely considered a subfamily of Thomisidae do not group within thomisids. However, Aphantochilinae previously generally considered as a separate family groups within thomisids.

Evolution of the sphingomyelinase D gene family in sicariid spiders

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Spiders in the family Sicariidae are well known for bites that cause dermonecrotic lesions in mammalian tissues. The venom toxin sphingomyelinase D (SMaseD) is a sufficient causative agent for lesion formation. This toxin is a member of a gene family about which little is known with respect to patterns of variation of venom-expressed paralogs within and among species. Understanding these patterns allows inference of mechanisms of evolution underlying the diversification of this toxin, and has relevance for understanding risks and treatments of bites. To date, inferring evolutionary mechanisms influencing these toxins has been limited by sparse taxon sampling of venom-expressed SMase D genes. We have isolated and sequenced SMase D cDNAs from representatives of all currently described species groups of *Loxosceles* and *Sicarius* and representatives from all continents on which they are native. Phylogenetic analyses of relationships among SMase D genes in comparison to patterns of relationships of species as inferred from 28s, CO1 and ND1 indicate that (a) the number of SMase D paralogs expressed in venoms may vary across species ranging from 3 to at least 7; (b) duplications are frequent in the SMase D family lineage.

Functionally independent components of prey capture are architecturally constrained in spider orb webs

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Orb webs first intercept and then retain insects long enough to be attacked by spiders. Improving either function increases prey capture and they are largely determined by different aspects of web architecture. We manipulated the mesh width of orbs to investigate its effect, along with web size, on prey capture by spiders and found that they functioned independently. Probability of prey capture increased with web size but was not affected by mesh width. Conversely, spiders on narrow meshed webs were almost three times more likely to capture energetically profitable large insects, which demand greater prey retention. Yet, the two functions are still constrained during web spinning because increasing mesh width maximizes web size and hence interception while retention is improved by decreasing mesh width because more silk adheres to insects. The architectural coupling between prey interception and retention has likely played a key role in both the macroevolution of orb web shape and the expression of plasticity in the spinning behaviors of spiders.

Biogeography of spiders across the boreal-tundra transition

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Spiders (Arachnida: Araneae) are ecologically important arthropods that exhibit high global diversity and are well-represented in northern ecosystems. Areas such as northwestern North America, which possess some of the highest rates of endemism, remain largely understudied compared to temperate zones. Spiders were collected in pit-fall traps from early June to mid August 2005 along 500 km of the Dempster Highway in the Yukon to examine effects of this latitudinal gradient and habitat transition on terrestrial arthropod richness, composition and abundance. Over 100 species have been identified and species show varying responses to the gradient. The two habitats seem to be important in determining species composition, however, no significant differences were found in species richness or abundance along the sampled transect.

Leg autotomy affects both terrestrial and aquatic locomotion in the wolf spider *Pardosa valens* (Part 2)

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Many spiders voluntarily amputate (autotomize) a leg as an antipredator behavior. While beneficial in the short term (as it can allow the spider to survive encountering a predator), leg autotomy may have detrimental effects over the longer term. In several species of wolf spiders, leg autotomy causes a reduction in burst sprint speed, an important trait both for avoiding predators and capturing food. In our first experiment we examined burst sprint speed before and after leg autotomy in males and females of the riparian-zone wolf spider *Pardosa valens* during June 2005. Since this species moves readily both on land and the water surface, we conducted experiments in linear race tracks mimicking both these surfaces. In terrestrial trials, males and females did not differ in speed, but both sexes ran significantly slower following loss of a leg. In aquatic trials, females ran significantly faster than males, and leg loss led to a significant decrease in speed for males but not females. We also found a potential temperature effect, as spiders run in the evening (when they were presumably warmer) were generally faster than those run during the morning. Despite females weighing nearly twice as much as males, all of the above results held when adjusting for body mass. Finally, males were

less likely to run on the aquatic track, and to go shorter distances when they did run, than were females. We repeated the above trials for females only during July 2006, and found no significant effects of autotomy or temperature on female running performance. These results suggest that both aquatic and terrestrial locomotion can be impaired by leg loss in *P. valens*, but that these costs may differ between sexes and age or season.

Patch characteristics and population density in *Geolycosa xera archboldi*, a burrowing wolf spider narrowly endemic to Florida Scrub

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Habitat fragmentation is considered a major threat to the persistence of many rare and endangered species. However, experimental studies of habitat fragmentation have shown both positive and negative effects on the density of populations in remnant habitat patches, reflecting autecological differences among species. We investigated the relationship between density of *Geloycosa xera archboldi* and the characteristics of patchy rosemary balds that it strongly prefers in native Florida Scrub. We used Akaike's Information Criterion (AIC) to evaluate the effectiveness of six a priori habitat models in predicting density of *G. x. archboldi* in rosemary balds. Only one model was strongly supported: there was a strong positive correlation between spider density and distance from a bald to the nearest sandy road or fire-lane. Other models (area of bald, shape complexity of bald, distance to nearest neighboring bald, time since last fire, and global) were not supported. Thus, contrary to our initial hypothesis, primitive roads and firelanes do not serve primarily as corridors of cursorial colonization; instead, they appear to be paths of emigration for spiders dispersing from balds. We wonder whether primitive roads and fire-lanes have a negative effect on *G. x. archboldi* density in Florida Scrub or, alternatively, if they may function effectively as highly linear "balds", thereby increasing the overall density of this narrowly endemic spider.

Spectral properties of the light environment and visual communication in the wolf spider, *Schizocosa ocreata* (Hentz)

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Animal color patterns often evolve as a compromise between natural selection for crypsis and/or inconspicuousness to predators, and sexual selection for conspicuousness to potential mates. In leaf litter dwelling spider species like *S. ocreata,* body coloration often closely matches the background coloration of a generally brown environment. As a rule, however, body parts used in communication often contrast against background coloration. We used spectral analysis to examine male and female wolf spiders for matching and contrasting coloration against leaf litter. Values were plotted in multivariate color space, based on reflectivity in different frequency ranges. When viewed from above (top prosoma, top abdomen), both males and females overlap with values for leaf litter and soil, but not green plants, suggesting cryptic coloration when viewed by potential predators. However, when viewed from a lateral perspective (side prosoma, side abdomen) both males and females show values that are polar opposites of the backgrounds, suggesting higher contrast when viewed by other spiders. Moreover, male secondary characters (leg brushes) used in visual signaling by *S. ocreata* show the highest level of background contrast. We tested the hypothesis that visual displays and leg tufts are more conspicuous against complex leaf-litter backgrounds with video playback of courting males superimposed on backgrounds of natural leaf litter in sun vs. shade. Results suggest that complexity and light level of the leaf litter background affect potential detection of male visual signals by females, and that male foreleg tufts increase chances of detection (and subsequent receptivity) against this background.

Undersampling bias: the null hypothesis for singleton species in tropical arthropod surveys

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Singletons—species represented by single individuals—average 32% of large tropical arthropod surveys. We use a large but incomplete census of spiders in one hectare of lowland forest to test four common explanations for singleton frequency (patchiness, body size, sex ratio, cryptic habits) against a null hypothesis of undersampling bias. Singletons are larger than other species, are disproportionately female, share no particular life-style, and do not clump at 0.25-1 ha scales. Monte Carlo simulation of the best-fit lognormal community shows that the observed data fit a random sample from a community of ca. 700 species and 1-2 million individuals. Previous studies also failed to find a strong biological rationale for high singleton frequencies. We argue that undersampling bias should be the default null hypothesis for singleton frequencies. Undersampling causes systematic negative bias of species richness. Our data suggest that sampling intensities of 350-1100 specimens per species are sufficient for reliable species richness estimates using standard non-parametric methods; at 61.6, the average sampling intensity in large tropical arthropod surveys is severely inadequate. Methodological advances to increase estimator efficiency combined with raised expectations for sampling intensity in tropical arthropod inventory studies are called for if species richness estimates are to be credible; increased use of the lognormal may be part of the solution.

Cape Cod spiders and their habitats

Robert L. Edwards
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During WWII and for some years afterwards, large tracts of agricultural land were abandoned. Subsequently, depending on the land use history, large acreages were left to develop on their own. Today there are a wide variety of sizable blocks of relatively uniform habitats. These have been sampled since 1990, larely by myself with some assistance in the field in upland areas. Particular attention is paid to comparing differences in species composition, and relative abundance in 11 different habitats when comparing numbers and weight of spiders. Whether looking at weight or number, the degree of relationship is evident. In this area two coniferous trees are particularly aggressive pioneers - Red Cedar (*Junperus virginiana* L. and Pitch Pine (*Pinus rigida* Mill. A third large block of introduced Norway Spruce (*Picea abies* L.) is also present. The effect of structure on the species composition is clearly evident. 'Hockey Stick' plots are useful for getting a first impression of which species constitute that set that dominates the population. They may be computed on the basis of average number/quadrat, total numbers or even weigh. Various approaches provide different insights and suggests further means of analysis, when comparing seasons for example.

Origins of *Synsphyronus* (Pseudoscorpiones) diversity on the outcrops of southwestern Australia

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Pseudoscorpions are found in a variety of habitats worldwide yet this arachnid order with at least 3300 species remains understudied. The genus *Synsphyronus* Chamberlin comprises 28 described species found in Australia and New Zealand. One region where this clade's diversity has not been fully documented is southwestern Australia, an ancient landscape noted for its floristic richness and granite outcrops. The granite outcrops form terrestrial habitat islands, refugia for isolated populations of outcrop-endemic biota including *Synsphyronus*. *S. elegans* was the sole described outcrop-endemic in this region, known only from the type locality, but recently two new morphospecies were collected from an outcrop 50 km away.

This project aims 1) to characterize the diversity and evolutionary relationships of *Synsphyronus* endemic to the outcrops in

southwestern Australia and 2) to elucidate the evolutionary origins of the outcrop-endemic lineages of *Synsphyronus* by reconstructing a genus-level molecular phylogeny. Specifically, we are testing the hypothesis that there are multiple origins of outcrop lineages. DNA sequence data provide a useful way to infer relationships as these pseudoscorpions are morphologically cryptic and exhibit high levels of homoplasy. The 70 populations we have sampled within a ~35,000 km^2 region sort into five morphospecies, which includes two described species. Data from *cytochrome oxidase subunit I* and *internal transcribed spacer region* indicate that these outcrop taxa are not monophyletic, but instead form four deeply differentiated lineages which largely correspond to four morphospecies. These data are consistent with the hypothesis that there have been multiple origins of outcrop lineages in southwestern Australia.

Examining the enzymatic action of select spider venoms on the phospholipids of sheep red blood cell ghosts

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It has proven difficult to identify those spiders which cause necrotic lesions. Aside from *Loxosceles reclusa*, conflicting reports from case studies and reviews have only managed to make identification of potentially medically significant spiders more confusing. In an attempt to clarify the medical significance of some of the spiders, we embarked on a survey of over 45 spider species venoms for there potential to cause hemolysis. Along with the known hemolytic activity of *L. reclusa* venom, we found the venom of *Cheiracanthium mildei* to be hemolytic as well. As an extension of that research, our lab examined the ability of select spider venoms to cleave phospholipids present in the membranes of sheep erythrocytes. Hemoglobin-depleted red blood cell ghosts were challenged with venom gland homogenates from *Argiope aurantia*, *Phidippus audax*, *Latrodectus geometricus*, *C. mildei* or *L. reclusa* for three hours at 37º C. The results suggest that the venom of *C. mildei* contains a phospholipase A2. However, even more interesting was the presence of phospholipase activity in the venom of *L. reclusa*, which along with sphingomyelinase D, cleaved most of phospholipids in the red blood cell ghosts.

Biological organization of molting in the scorpion *Heterometrus swammardami*

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Schaumburg Township Human Services

Although a lot is known about molting in insects, it is regrettable that we know very little concerning it, in the case of arachnids, especially in the scorpions. Our long-term study of the scorpion *Heterometrus swammerdami* has revealed interesting information in this archaic group. Structurally and functionally, in many respects, the biological organization of molting is different in this scorpion. This difference reflects in the fact that in the scorpion there are only a series of molts without metamorphosis resulting in physical growth and sexual maturity. Protocerebral neurosecretory cells, leucocytes, and the `blind end organ' the rostral organ, the hypocerebral ganglion and the frontal ganglion are some of the structures intimately connected functionally. Neurosecretory effectors from the brain, effector's following systems, signaling messaging devices, and some feedback mechanisms shall be discussed in the presentation.

Shifting metabolic needs during development: The proximal path to giant females

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Nephila clavipes life history has two widely known attributes: extreme sexual size dimorphism, and highly variable but exceedingly large female body size. In an effort to determine how much of the variation in body size is caused by food availability, we designed a common garden experiment subjecting juveniles to low, medium, or high food levels (45%, 56% or 84% mean post-molt mass in live prey/week) starting with dispersal (3rd instar). Males and females responded differently to the experimental diets: nearly all males reached sexual maturity by the fifth instar. Male size at maturity varied with diet, but total developmental time did not. For females, these diet levels were sufficient for normal development only until the sixth instar, at which time they ceased growing. We found that an increase of 50% in food levels restored development, allowing surviving individuals to reach maturity. In females, both size and total developmental time varied with diet. We compare these data to an ongoing experiment where all individuals are shifted to the higher food levels in the beginning of the 6th instar.

Once bitten, twice shy? Aggressive male mating behavior and fang use in the brush-legged wolf spider *Schizocosa, ocreata*

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Where sexually receptive females are limited, sexual selection is driven by increased competition between males and/or the degree of female choosiness. This may result in sexual conflicts of interest between males and females. Under these circumstances, increased selection pressure on males can result in aggressive and/or coercive male mating behaviors to counter female choosiness and/or resistance. In *S. ocreata*, males exhibit elaborate courtship displays, but even when females are not receptive, mounting and subsequent copulation sometimes occur. Analysis of mating trials indicates an apparent rate of 12.7% coercive mating and forced copulation. Principal Component Analysis revealed distinct behavioral patterns associated with outcome of coercive vs. cooperative mating trials. While most pairings included male courtship and receptivity displays by females before mating, we found decreased receptivity and increased resistance to aggressive males by females in coercive matings.

Adult male *S. ocreata* have been observed to use fangs during copulation, resulting in hemolymph loss and scarring in females. We experimentally immobilized male fangs and compared mating success between manipulated and control (sham manipulated) groups. Although there was no difference between groups in mating success, we found reduced copulation duration time for those males unable to use their fangs. Preliminary analysis suggests no increase in reproductive success associated with copulation duration time or fang use, although males who mate coercively may gain potential fitness benefits from reduced courtship cost. The role of coercive mating as a reproductive tactic in *S. ocreata* will be discussed.

Patterns of reproductive success associated with social structure and microclimate in *Anelosimus studiosus* (Araneidae, Theridiidae)

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In east Tennessee, the Theridiid spider *Anelosimus studiosus* varies widely in its social structure from the solitary/territorial female with her offspring, to cooperative colonies of tens to hundreds of adult females. In previous work, we developed a brood fostering model that predicts that in cooler environments mothers in multiple-female colonies will have a selective advantage over solitary female nests. This is because the rate of juvenile maturation is slowed and the mother has a higher probability of dying before the brood reaches independence. In her absence, other females would foster her brood. We tested this hypothesis by manipulating colony size and by monitoring the reproductive success of naturally occurring solitary- and multi-female colonies in cold and warm temperature environments. Our results indicate that while multiple-female colonies have higher fitness at cool sites, the solitary female nests achieve higher fitness at warmer sites. The higher reproductive success of multi-female colonies at cold sites further reflects the total failure of solitary female nests at these sites. Surviving solitary female nests generally had higher reproductive success than multi-female colonies. In natural colonies, fitness is highest for smaller multi-female colonies in the colder environments, and decreases in the larger colonies. We use these data to refine the brood-fostering model and discuss the results with regard to the observed polymorphism in social structure.

The benefits and costs of group courtship in the sexually cannibalistic species *Dolomedes triton*

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Predatory females place constraints on male courtship in sexually cannibalistic species. For example, courting in groups may increase competition for mating opportunities, but it also can reduce an individual male's likelihood of being cannibalized. Small groups of male *Dolomedes triton* have been observed in the field simultaneously exhibiting courtship; participation in such group courtship may represent a tradeoff between safety and mating success. Laboratory tests of this hypothesis were conducted using newly molted adult females paired with either a single male (n=24) or two males (n=26). Field-caught juvenile spiders were allowed to mature in the laboratory. Males were tested in both conditions (singly and with another male), with order of the trials randomly assigned. The presence of other males did not result in significant benefits or costs to males. Cannibalism rates were not statistically different for single males (12.5%) and focal males in 2-male trials (7.7%), and the presence of a competitor did not cost males in lost inseminations. Single males mated in 37.5% of trials, while focal males in 2-male trials mated in 31% of trials. Females, however, derived many benefits from having two males present. They were more likely to mate if two males (54%), rather than one male (37.5%), were present and were almost twice as likely to cannibalize if two males were present (23%) than one (12.5%). Group courtship in *D. triton* may not reflect male strategies for reducing cannibalism, but may instead represent a mechanism for female choice in this species.

Diversity of canopy spiders at multiple spatial scales in hardwood forests of southern Québec, Canada

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Understanding how arthropod diversity is distributed in space within ecosystems is essential to infer on the processes that govern their diversity. I hypothesize that hierarchically nested spatial scales do not contribute equally to the regional spider diversity pool. As such, I set out to characterize and compare the diversity patterns of canopy and understory spiders on sugar maple (*Acer saccarrhum* Marsh) and American beech (*Fagus grandifolia* Ehrh) at multiple spatial scales during the summers of 2005 and 2006. Following a hierarchically nested design in space, spiders were sampled in the canopy of 45 sugar maple and 45 American beech trees. Sampling in the canopies was done with the DINO 260xt® a mobile aerial lift platform towed from site to site with a 4WD vehicle. The canopy of 3 individuals (1st scale) of each tree species were sampled by beating the foliage in maple-beech stands (2nd scale) replicated 5 times in 3 sugar maple forests (3rd scale) found within the greater Montréal region (4th scale). Our results based on a NMDS ordination, a NPMANOVA, and a partitioning of species richness show that the diversity and species composition of canopy and understory spiders differs on sugar maple and American beech. Also, that species diversity patterns in space are non random in the understory and the canopy, and that the spatial scales considered do not contribute equally to the regional spider diversity pool.

Avian predation on the Brush-legged Wolf Spider, *Schizocosa ocreata* (Hentz), and anti-predator responses to avian cues

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Males in several animal taxa, including birds, fish and spiders, have been shown to exhibit protective responses if they encounter predator cues while courting. Male courtship communication in the Brush-legged Wolf Spider *Schizocosa ocreata* is highly conspicuous, and both visual and seismic signals of this species have been shown to increase detection by vertebrate and invertebrate predators in laboratory studies. We tested the hypothesis that avian predators pose a risk to spiders in the field, by tracking survival of male *S. ocreata* during the breeding season in two experimental field enclosure treatments (covered to exclude birds and uncovered to allow birds access). Covered enclosures had significantly more spiders remaining after two weeks of the breeding season than did uncovered enclosures, and the slope of the rate of loss over time was greater for uncovered enclosures. Given the significant potential risk of predation from birds suggested by these results, we hypothesized that male *S. ocreata* might alter courtship behavior in the presence of cues associated with avian predators. We tested this hypothesis by analyzing responses of male *S. ocreata* to auditory stimuli from avian and non-avian sources. Males ceased courtship more often or ran away in response to bird calls compared to non-threatening sounds (katydid song, white noise). In addition, latency to resume courtship after the stimulus was significantly longer when presented with a bird call than a non-threatening sound. These results suggest bird predation could be an important source of selection on courtship behavior in these forest litter-dwelling spiders.

The arthropod community associated with webs of a subsocial spider *Anelosimus studiosus* (Theridiidae)

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Spiders are usually solitary predators that only come together to mate, but the subsocial spider, *Anelosimus studiosus*, tolerates conspecifics and other arthropods in its web. I found and identified the arthropod species living in these webs. I randomly collected 250 webs in their entirety, including the branch each web was wrapped upon and any leaves that were attached. I took five webbed branches and five control, non-webbed branches from each tree. In addition, I collected 50 webs each from *Agelenopsis* sp. and *Linyphia* sp. to see if any other arthropods were present in webs similar to *A. studiosus*. One thousand and six arthropods and 105 species of arthropods were found in the 250 *A. studiosus* webs; 91 of these species were found only in the webs and not in the controls. There were 56 species of arachnids, representing 14 families. There were also species of Diptera, Lepidoptera, Coleoptera, Hemiptera, and Hymenoptera living in *A. studiosus* webs. The arthropod fauna in 50 *Agelenopsis* sp. webs supported a total 141 arthropods and 34 species; 14 of these species were also found in *A. studiosus* webs. The Linyphiidae webs sampled did not contain any other arthropods. The community of arthropods in *A. studiosus* webs consisted of herbivores, carnivores, omnivores, kleptoparasites, and parasitoids.

The contribution of axial fiber elasticity to the adhesion of viscous capture threads spun by orb-weaving spiders

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A pair of axial fibers produced by flagelliform glands supports the prey capture threads of araneoid orb-weaving spiders. Aggregate glands cover these fibers with a complex aqueous solution that coalesces into droplets, each containing a glycoprotein granule. The stickiness of these threads is enhanced by a suspension bridge mechanism (SBM) that recruits the adhesion of multiple droplets. This study tested the hypothesis that axial fiber elasticity is crucial for the operation of the SBM. It did so by comparing the stickiness of threads producing by five species of the family Araneidae (*Araneus marmoreus, Argiope aurantia, Micrathena gracilis, Verrucosa arenata,* and *Cyclosa turbinata*) at their native lengths and when elongated to two and three times this length. To maintain the number of droplets contributing to a thread's stickiness, we measured threads with contact plates whose widths were proportional to thread elongation. Using the strain of each species' thread at rupture, we computed the percentage increase in its Young's modulus (PYM, an index of the stiffness of a material) at each elongation. For all species but *A. marmoreus*, PYM was inversely related to thread stickiness and contributed either alone or in conjunction with droplet volume to the stickiness per droplet of a species' thread. Axial fiber elasticity appears to increase the stickiness of viscous threads by allowing an increase in the angle between a loaded capture thread and the surface it contacts, thereby enhancing the thread's ability to recruit the adhesion generated by multiple droplets.

Brown recluse weight dynamics: An informal discussion

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Brown recluse spiders (*L. reclusa*) have been known to survive for months with no food or water, yet basic predatory and ingestion behaviors for this spider species have not been well documented. This study focuses on spider daily weight fluctuations, rate of prey ingestion, and predator weight gain vs. prey

weight loss comparisons, in addition to applying Waldbauer indices such as percentage weight gain, feeding mass transfer ratio, and the relative growth rate as pertaining to a carnivorous arachnid. Feeding behaviors, such as the tendency of this spider to attack prey significantly larger than themselves, are also discussed.

Plant litter and fertilization alter epigeal spider (Araneae) community structure in a temperate grassland

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Nutrient enrichment of terrestrial ecosystems increases plant biomass and plant litter production while decreasing plant species richness. However, the effects of these well-documented, nutrient-mediated changes to primary producers on the epigeal spider community remain largely unexplored. To address this, we manipulated nutrient availability and plant litter in grasslands in northeastern Ohio to investigate whether nutrient-mediated changes in plants and plant litter resulted in increased spider biomass/abundance and decreased spider species richness. While documenting changes in plant biomass and species richness during 2002-2005, we used pitfall traps to sample the epigeal arthropod community. Within 20m diameter circular plots in an old-field grassland, we manipulated nutrients (NPK fertilizer added vs. no fertilizer) and plant litter (following annual mowing in autumn; plant litter removed vs. left in place) to form a blocked 2x2 factorial design with six replicates (N = 24 experimental plots). Four pitfall traps per plot (N = 96 traps) were used to sample arthropods for alternating two-week-open/ two-week-closed intervals during late May through mid-August of each year. For all years, fertilization significantly affected epigeal spider community structure, with a few, common species becoming hyper abundant in fertilized plots. During 2002-2004, only fertilization significantly affected spiders, with increased biomass/ abundance and slightly decreased species richness. However, following an unusually high amount of April snowfall during 2005, plant litter was the only significant influence on epigeal spiders, significantly decreasing species richness. These results indicate that epigeal spiders may respond differently to anthropogenic influences and that global climate change may affect local arthropod community stability.

Field observations of activity patterns and behavior in *Schizocosa ocreata* (Hentz)

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The expression of elaborate courtship characteristics, such as the suite of multimodal traits and behaviors used by male, *Schizocosa ocreata*, wolf spiders (Lycosidae) to signal females, is generally believed to represent a balance between sexual and natural selection. To date, field studies that address aspects of the natural history of this species are few and most of the evidence supporting either sexual selection benefits or physiological, predatory, or competitive costs associated with the use of complex display characteristics has been based on laboratory observation. To truly understand the importance of various display characteristics, it is absolutely critical to examine the overall activity and use of these traits and behaviors in a natural setting. In the spring of 2001, we began a comprehensive, long-term survey of male behavior and activity patterns in the field, which concluded at the end of the 2005, spring breeding season. Over the five field seasons in the study, we used a combination of systematic collections, focal individual observations, and scan sampling to establish phenology patterns, activity patterns, inter-individual spacing, and interaction rates with conspecifics and heterospecifics. We present here initial results of this survey with particular emphasis on phenology patterns and male behavioral patterns within and between seasons.

Vouchering DNA barcoding specimens: Test of a non-destructive extraction protocol for arachnids

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The correct identification of species is essential to the performance of ecological research. Morphology-based keys support accurate identification of many taxa. However, for taxa that are not well studied, or for which distinguishing morphological characters have not been discerned, identification can be difficult. Accurate identification is especially problematic for very small organisms, for members of sibling species, for eggs, and for immatures. For such cases, DNA barcodes may provide diagnostic characters. Ecologists deposit museum vouchers to document the species studied in their research. If barcodes are to be used for identification, then both the DNA and the specimen from which it was extracted should be vouchered. We describe a protocol for the non-destructive extraction of DNA from terrestrial arachnids, using as examples members of the orders Acarina and Araneae. We successfully extract sequenceable DNA from all species after 1 – 4 h of immersion in extraction buffer. The extracted carcasses, processed and imaged using protocols standard for the taxon, were distinguishable from closely related species, and adequate as morphological vouchers.

How to avoid being consumed by a relationship risk of sexual cannibalism affects how male wolf spiders search for females

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Chemical cues (silk, excreta, feces) reveal a wide array of specific information about a conspecific but do not provide accurate locational information. Thus a male searching for mates may focus on different features of the female's chemical signature if there is a risk of sexual cannibalism. We tested this idea by comparing how the males of two species of wolf spiders (Araneae, Lycosidae) reacted to air and substrate borne chemical cues from females. Female *Pardosa milvina* rarely engage in sexual cannibalism (<1%) whereas female *Hogna helluo* consume males more than 35% of the time. *Pardosa* males are attracted by airborne cues from females but *Hogna* males are repelled by them. Although *Pardosa* males change activity and courtship intensity in the presence of substrate chemical cues from females that differ in mating status (mated vs virgin), their was no difference in their response to those same cues from food-limited and well-fed females. On the other hand, substrate chemical cues from mated or virgin females did not affect the activity or courtship intensity of *Hogna* males. However, *Hogna* males were more likely to follow the cues of well-fed females and courted more vigorously on substrate cues from well-fed females. We conclude that the potential for sexual cannibalism in *Hogna* causes them to be more sensitive to female hunger whereas *Pardosa* males, with a low probability of cannibalism, use the same type of cues to focus on the mating status of females.

Spider colonization of apple orchards

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The colonization of agroecosystems by natural enemies is an important demographic process, as regular disturbances may reduce their populations.We studied colonization of apple orchard foliage in Southern Québec, Canada, by spiders, an abundant and diverse group of generalist predators in orchards.We planted twelve "micro" orchards (consisting of ten 1.7m apple trees) at two distances (10 m and 50 m) from deciduous forest, and spiders were collected from the tree foliage from June to September. We determined the rate and

phenology of spider colonization, and the effect of distance on the spider assemblage composition. We also compared the relative abundance of species in the micro-orchards to those in older orchards. Spider colonization of micro-orchards reached a peak rate in late July, up to 40 spiders/week/m3 foliage. Spider assemblage composition significantly differed between micro-orchards depending upon their distance from the deciduous forest, even at this small spatial scale, and assemblage composition was more similar to that of the forest in the micro-orchards near to the forest. In orchards that had been established for a longer time (15+ years) the dominant spider species were the same as in the micro-orchards, but had different relative abundances, indicating that local factors modulated the assemblage composition after colonization.

Whip spiders produce an agonistic display that is detected by their opponent's trichobothria

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Arachnid trichobothria respond to the movements of air particles. Some types of air particle movement give away the presence of a predator or prey item, and the trichobothria of many arachnid species are important in detecting these stimuli and mediating an appropriate escape or prey capture behavior. Here we present evidence suggesting that the trichobothria of whip spiders (Arachnida, Amblypygi) also play a role in the detection of a particular display that they produce during agonistic contests. This display consists of a vigorous vibration of one antenniform leg, and it is produced for a significantly greater fraction of contest duration by contest winners than by contest losers. Here we show that, during an antenniform leg vibration display: (i) the vibrating antenniform leg of the displaying whip spider is positioned above its opponent's walking legs, which bear trichobothria; (ii) the vibrating antenniform leg can excite the sensory cells of these trichobothria via air movements and without direct contact; (iii) the antenniform leg of the displaying whip spider vibrates at a frequency that causes strong excitation but little adaptation in the trichobothrium sensory cells; and (iv) the duration of an antenniform leg vibration display can be extracted from the response of a trichobothrium sensory cell. Whip spider trichobothria may, therefore, play an important role in agonistic contest behavior.

Spontaneous death and male mate choice in the fishing spider, *Dolomedes tenebrosus* Hentz, 1843 (Araneae, Pisauridae)

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Sexual cannibalism is defined as the killing and consumption of males by females during some stage of sexual reproduction (i.e. courtship, copulation, or following copulation). Sexual cannibalism is quite common in a number of spider families and can affect the population size, sex ratio, ecology, and behavior of many species. In some sexually cannibalistic spider species, males appear to sacrifice themselves, facilitating their death and consumption by a female. In most cases of sexual cannibalism, females will kill and consume males, but examples of spontaneous male death do exist. Here, we describe the prevalence of spontaneous male death in the fishing spider D*olomedes tenebrosus*. Laboratory experiments and field observations reveal that males spontaneously die immediately upon the insertion of their first pedipalp. Since males of this species appear to be limited to a maximum of one copulation, using only one pedipalp, their mating investment appears to be extremely high and thus, one might expect males to exhibit strong mate choice. In support of this prediction, we have preliminary evidence suggesting that *Dolomedes tenebrosus* males do indeed show mate choice, as some males appear to reject some females.

Phylogeny of *Hogna* and *Rabidosa*; insights from a morphological study

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Understanding relationships of large wolf spiders in the southeastern USA has been challenging, made difficult by uncertain taxonomy and in some cases by the cryptic lifestyle of some species. I present here a work in progress that examines these large and interesting wolf spiders. A morphological phylogenetic study was completed using 33 taxa including species from *Alopecosa, Camptocosa, Geolycosa, Hogna, Rabidosa, Schizocosa,* and *Trochosa*. The study included *Hogna radiata* from France, the type species for the genus *Hogna*. 117 characters were scored for all taxa. Of these characters, 108 were found to be parsimony informative. 70 characters were somatic, 26 were male palpal characters and 20 were female epigynal characters. Heuristic searches were completed using PAUP*with 1000 random starting point heurist searches using the Step wise addition option and the TBR branch swapping algorithm. With all characters weighted equally, 6 most parsimonious trees were found. A consensus tree suggests there are two large clades with members of *Hogna* found in each clade. The larger clade included all *Rabidosa* species, as well as *Geolycosa* species and some *Hogna* species including the *Hogna radiata*. The smaller clade included *Schizocosa, Trochosa* and two species of *Hogna*. *Alopecosa* was basal to these two clades. This study suggests something that is already well known: wolf spider phylogeny and taxonomy is difficult and confused.

The effects of predation risk on female silk deposition and male response to predator-cued or uncued female silk in the wolf spider *Pardosa milvina*

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Females of the wolf spider, *Pardosa milvina*, advertise sexual receptivity toward males via pheromone-laden silk draglines and male *Pardosa* exhibit conspicuous species-specific courtship (leg-waving and tapping) when encountering silk from unmated females. Previous studies have shown that: 1) silk and excreta produced from the larger co-occurring predatory wolf spider, *Hogna helluo*, induces adaptive antipredator responses (immobility) in *Pardosa*, 2) the presence of *Hogna* silk causes significant reductions in male *Pardosa* courtship behavior when encountering conspecific female silk, and 3) *Hogna* is preferentially attracted to silk and excreta deposited by female *Pardosa* when previously fed *Pardosa*. Taken together, these studies suggest that 1) female *Pardosa* may benefit by limiting silk advertisements and excreta deposition when encountering silk from the predator, *Hogna* and 2) male *Pardosa* may exhibit reductions in courtship when encountering silk from females previously exposed to *Hogna* silk. In this experiment we compared the amount of silk and excreta deposited by unmated female *Pardosa* exposed or not exposed to predator cues from *Hogna*. We also measured and compared male *Pardosa* courtship intensity and duration in the presence of silk from females previously exposed or not exposed to predator silk from *Hogna*. Contrary to our prediction, we found a significant increase in excreta and silk deposition among female *Pardosa* in the presence of predator cues. However, we found no significant difference in the propensity of males to court or courtship latency in the presence of silk from predator-cued or uncued females.

More than just a pretty face? A potential quality-signaling role of facial coloration in *Habronattus pyrrithrix* (Salticidae)

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The role of bright, conspicuous coloration as an honest indicator of male mate quality has been well studied in many vertebrates (such as birds, reptiles, and fish), and in some invertebrates (such as butterflies and damselflies) but has rarely been examined in spiders. In *Habronattus pyrrithrix* jumping spiders (family Salticidae) females have dull and inconspicuous coloration, while males have a brilliant red patch of color on their face. Males display this facial coloration to females during an elaborate courtship dance. Because color is often a costly visual signal, male color has the potential to function as an honest signal of mate quality. If this is the case, males with the brightest colors should also be in the best physical condition. To test this prediction, we estimated the body condition of wild-caught adult males and quantified their coloration using microspectrophotometry. We found that aspects of male color (hue and red chroma) were indeed positively correlated with body condition, suggesting that this color has the potential to function as a mate quality signal.

Because variation in color expression may be explained by underlying morphological variation in the facial scales in which this color is produced, we imaged a subset of the brightest and drabbest males using scanning electron microscopy (SEM) and compared several aspects of morphology between bright and drab males. Results of the SEM work should help us gain insights into the mechanisms of condition-dependence.

Sublethal insecticide exposure influences behaviors of web-building spiders

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Many arthropodicides kill target and non-target species by affecting their nervous systems. Since an animal's behavior is governed by interactions among nerve cells, it is not surprising that even low doses of pesticides influence various arthropod behaviors. Web-building spiders have extended contact with broadcast pesticides since their snare serves as a collector of the toxin. Field and laboratory experiments using digital web analyses show that web-weaving spiders (*Argiope trifasciata*, *Araneus diadimatus, Araneus marmoreus*) exposed to sublethal doses of malathion built webs with altered configuration, structure, and function. These changes, in conjunction with other behavioral changes after malathion exposure (feeding, egg sac production) impair prey capture and reproduction. For example, dosed *A. diadimatus* built significantly smaller webs with greater irregularity than non-treated spiders in the lab. Exposed spiders displayed this response in a dose-dependant manner, and never recovered normal web construction. *Argiope trifasciata* dosed in the field also built smaller and more irregular webs. Furthermore, dosed *A. trifasciata* laid fewer and lighter egg sacs than controls. *Araneus marmoreus* dosed in the lab were unable to construct webs and simply deposited patches of silk on cage surfaces. This effect lasted over seven weeks. A consistent lab finding was that dosed spiders tended not to feed. Perhaps altered web vibration characteristics impaired prey signaling to spiders, the spiders were unable to correctly process sensory information, or they could not perform appropriate prey capture behaviors. Furthermore, since proper communication during courtship and mating is crucial, distorted web vibrations could impair reproductive processes.

The active space of multi-modal communication for male *Schizocosa ocreata* (Hentz) wolf spiders in a complex forest floor environment

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We examined the influence of the complex leaf litter microhabitat on transmission of multimodal (visual and seismic) signals of courting male *Schizocosa ocreata* (Hentz) wolf spiders (Araneae: Lycosidae) and measured the "active space" of signals in the field and lab. We measured maximum visual detection range of prey and courting males by females in laboratory studies, and used laser distance measures to determine effective line-of-sight visual detection distance in the field. We used Laser Doppler vibrometry to record the seismic component of male courtship in the laboratory on natural substrata typical for the habitat (leaves, bark/wood, soil, and rock) and to measure seismic vanishing point distances *in situ* in the field. Laser vibrometry revealed that leaves are highly conductive substrata for seismic signals in contrast to other habitat surfaces (soil, wood, rock), but there were no significant differences between leaf species. Seismic signal amplitude and frequency spectra both attenuate with distance in leaf litter. While mean potential detection distance of visual signals is similar to that of seismic signals, the range of visual signals exhibits greater variation owing to the patchy nature of the forest floor habitat. Moreover, the maximum visual range of spiders appears to be greater than the active space of seismic signals. The role of complex habitat structure and spider sensory range in the evolution of multimodal communication will be discussed.

Reports of brown recluse spider bites greatly outnumber verifications of *Loxosceles* spiders in Pennsylvania and South Carolina.

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Throughout portions of North America where *Loxosceles* spiders are rare or have never been documented, both the medical community and the general public fervently believe that brown recluse spiders, *L. reclusa,* are common constituents of their local spider fauna and routinely blame the spiders for mysterious skin lesions. But you already knew that. Pennsylvania is outside the native range of the brown recluse spider and South Carolina is at or just beyond the southeastern margin. Recluse bite reports to two Pennsylvania poison control centers (N = 158 including 25 assessments by medical personnel) and medical loxoscelism diagnoses from other sources (N = 26) were recorded for 40 of Pennsylvania's 67 counties whereas the sparse numbers of *Loxosceles* spiders have only been documented in seven counties. In response to South Carolina questionnaires regarding arthropod-related maladies, primary care physicians reported 478 brown recluse spider bite diagnoses in 1990 (with 42% response rate) and 738 in 2004 (with 19% response rate). If extrapolation to 100% response is accurate, this gives estimates of 1,138 and 3,884 South Carolina loxoscelism diagnoses for 1990 and 2004, respectively. In 2004, physicians diagnosed loxoscelism in 38 of South Carolina's 46 counties while less than 50 brown recluses in only six counties (one location per county), have ever been historically found there. Brown recluse spider bites are overdiagnosed and overreported in Pennsylvania and South Carolina. Dissemination of this knowledge will increase health care in addition to stopping the widespread nonsense.

Sex pheromones in the wolf spider, *Hogna helluo* (Araneae, Lycosidae)

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Wolf spider courtship behavior involves both visual and chemotactile components. In some species, males utilize sex pheromones associated with silk draglines and other excreta to locate females and assess the quality of potential mates. In the large wolf spider *Hogna helluo,* we tested the hypotheses that 1) males can detect the chemotactile cues of potential mates, 2) female pheromones would elicit male courtship behavior and 3) males would use chemotactile cues to discriminate between virgin vs. mated females. Male *H. helluo* behavior was compared among three cue conditions (blank substrate, virgin female cues, and mated female cues). Males moved more slowly and spent more time in non-forward motion in the presence of female cues compared to controls. Males engaged in significantly more leg taps, a sensory behavior that also is a component of courtship, in the presence of female cues. However, the behaviors we quantified did not differ between the mated and virgin cue treatments. These results suggest that male *H. helluo* use chemotactile cues (i.e., pheromones) in mate location and they are sufficient to elicit the early stages of courtship. However, we have no evidence that males could differentiate between mated and virgin females from these chemotactile cues. If they could distinguish a difference, the information about reproductive status did not affect their behavior. If females are difficult to locate and if they, at least occasionally, mate multiply, then it may be worth it for males to approach all females until her receptivity can be determined.

Differential responses between male and female *Leiobunum vittatum* harvestmen (Opiliones, Sclerosomatidae) towards conspecific contact chemicals

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In preliminary observations of the harvestmen *Leiobunum vittatum,* we found that individuals rub their bodies against the substrate, suggesting chemical marking. To determine if this behavior could function in intraspecific communication, we examined the behavior of *L. vittatum* on filter paper upon which conspecifics had resided. Testing consisted of monitoring a male or female for 15 minutes in a circular arena divided in four quadrants - two of which had filter paper previously impregnated either by males, females, or a blank treatment. In the quadrants

impregnated with male and female cues, males spent more time, scraped the sensory legs I more often, and engaged in pedipalp tapping more often, suggesting that males are able to detect cues left on the substrate by conspecifics. Males also displayed two behaviors (regardless of the impregnating sex) never seen among females – (i) "fast approach" and (ii) "jerking". Females did not spend more time in quadrants with conspecific chemicals but did spend more time tapping their pedipalps on male– vs female-impregnated filter paper, suggesting that females can detect differences between male and female chemicals. In a second experiment, we examined whether females could distinguish between the contact chemical cues of males based upon their fighting ability. Females were offered a choice between filter papers previously impregnated by two conspecific males. We found no evidence that females discriminated among males based on their previous contest outcome. In summary, results presented here suggest that intraspecific communication in *L. vittatum* may be mediated in part by chemical signals.

POSTER ABSTRACTS

*Indicates student competition; presenters in **bold**

Microhabitat selection and movements of harvestmen (Opiliones: Phalangida) in gardens

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Harvestmen are ubiquitous and abundant generalist predatory arthropods, yet little is known about their ecology and behavior. They are known to consume a variety of pests, and due to their prominence in agroecosystems, great dispersal ability, and gregarious tendencies, they may have potential as agents of biological control in gardens. This study used mark and recapture methods to investigate the feasibility of sustaining a harvestman population (Opiliones: Phalangida) in a garden. Unrestricted harvestmen movements were systematically followed and small, wooden shelters shaped like lean-tos were placed as diurnal refugia for these humidity-sensitive predators in an attempt to prevent their emigration. Furthermore, it was predicted that more harvestmen would be observed in dense vegetation where microclimatic conditions (temperature & humidity) should be more favorable during the day. Significantly lower daytime temperatures and reduced temperature variability were recorded in denser vegetation. More harvestmen inhabited dense vegetation than areas of sparse or no vegetation. Significantly more harvestmen were observed in the proximity of shelters, thus, adding shelters reduced their tendency to leave the garden. The range and movements of harvestmen tended to be less in areas of dense vegetation and near shelters than in more exposed areas.

Resources for research on arachnids and other non-insect arthropods at Carnegie Museum of Natural History, Pittsburgh

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The Section of Invertebrate Zoology at Carnegie Museum of Natural History (CMNH) is recognized worldwide for insect collections exceeding 11 million specimens. Non-insect resources at CMNH are less well known and infrequently used, especially non-acarine Arachnida and crayfish (Crustacea: Astacoidea). On-staff expertise was limited until recently; now a visiting curator works on crayfish (JWF) and a research associate on spiders (CWB). Historic arachnid holdings include Brazilian spiders of H.H. Smith (1880's), and Pennsylvanian spiders from B. Vogel (1960's). Since 1985 extensive trap-based collecting worldwide has provided sample residues containing diverse arachnids. The A. Ortmann Crayfish Collection (1900's), with recent material from Nearctic and Australian regions, comprise crustacean holdings exceeding 2,000 lots. Collection facilities have been renovated since 1981 by four NSF grants. Storage in standardized glassware is far-advanced, and emphasis placed on curating new material from fieldwork and historical samples. Collections are associated with library materials including most pre-1950 literature; post-1950 coverage is less comprehensive, but actively supplemented as collections require. Information initiatives for arthropod specimens are expanding (links from homepage http://iz.carnegiemnh.org/inverts/izhome.html). On-line databases will cover crustacean and arachnid holdings as curation permits. Web-based projects include compiling a list of Pennsylvania spiders using the "Catalog of Pennsylvania Biodiversity", a web-accessible checklist of specimens documenting Pennsylvania occurrence. CMNH hosts "Global Crayfish Resources" developed by JWF, including a taxonomy browser, checklists, discussion forum, and International Association of Astacology's homepage. CMNH endeavors to make non-insect arthropod resources accessible to active investigators interested in systematics, faunistics, and issues related to conservation and resource management.

Variation in the material properties of the silk in the common house spider

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Spider webs are capture devices that depend upon both web structure and mechanical performance of the silk fibers to capture prey. Alterations in the material properties of these silk fibers could therefore change web function, but there is little direct evidence for this. We investigated the mechanical performance of the silk of *Achaearanea tepidariorum* (Araneae: Theridiidae) fed two different types of prey (large, fast crickets versus small, slow isopods) for one week. *A. tepidariorum* spins a cobweb composed of several main structures, including supporting threads, and gumfooted line capture threads. By comparing silk within each component, we found that silk in the support region of cobwebs was tougher, and more elastic when spiders were fed crickets. In contrast, the material properties of the gumfooted capture threads of cobwebs did not differ between the two groups of spiders. Thus, spiders fed larger prey seem to spin stronger supporting threads that break at higher extension. They also spun thicker, and therefore stronger, fibers. However, spiders fed large prey tended to be in better body condition than spiders fed smaller prey, despite receiving overall equal amounts of food. Therefore, it is unclear whether this variation in mechanical properties is a response to the type of prey itself or to differences in relative body conditions of spiders. Whatever causes this variation, spiders fed large prey spun more robust webs, able to resist to high kinetic-energy prey and support heavier spiders.

Energetic costs of courtship signaling in two wolf spider species with divergent courtship behaviors

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Active, complex display behaviors of males may provide information about male quality to females, and are considered to be "honest" indicators of male quality. As a consequence, females may prefer males capable of sustaining higher levels of energetically costly behavior. We measured energetic costs of courtship behavior for two sympatric wolf spiders [*Schizocosa ocreata* (Hentz) and *S. rovneri* (Uetz & Dondale)] which are reproductively isolated on the basis of differences in courtship behavior. These sibling species exhibit distinct courtship behaviors with different activity levels: *S. ocreata* uses multimodal communication (visual and vibratory signals) and an actively moving courtship display, while *S. rovneri* uses only vibratory signals produced while stationary. Energetic expense (peak CO_2 output) was recorded using a Sable Systems TR-2 flow-through respirometry system for spiders engaged in three behavioral activities: stationary, locomotion, and courtship behavior, and was found to vary significantly with species, individuals, and behavioral activity. No significant differences existed between species in peak CO_2 output during stationary or locomotory behaviors, although these behaviors were significantly different within species. Courtship behavior of both species had significantly greater peak CO_2 output than the other behaviors, and differences between species were significant. The active "jerky-tapping" courtship of *S. ocreata* produced higher peak CO_2 levels than the stationary vibratory "abdomen bounce" display of *S. rovneri*. Differences in the energetic costs of courtship for these closely-related species may reflect the influence of sexual selection for different male signaling strategies.

The costs and benefits of freezing in the presence of a predator in a Leiobuninae harvestman (Opiliones, Sclerosomatidae)

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In this study, we aimed to determine the costs and benefits associated with a specific defensive behavior displayed by immature Leiobuninae harvestman from North America (Opiliones, Sclerosomatidae). Preliminary observations showed that immature individuals often become immobile (*i.e.*"freeze") in the presence of the syntopic wolf spider *Schizocosa ocreata* (Araneae, Lycosidae). Harvestmen paired with spiders spent more time motionless than harvestmen alone or harvestmen paired with another harvestman. In order to determine if this immobility could decrease the likelihood of an attack by a spider, we examined the spider's willingness to attack and eat motionless versus moving prey. *Schizocosa ocreata* individuals were paired with either living, and thus moving, crickets versus crickets that had been frozen to death and were thus motionless. Preliminary analyses suggest that the spiders took significantly longer to prey upon the motionless cricket than the live one. Some spiders never preyed upon the dead cricket, but readily ate a live cricket offered immediately after the trial. A third experiment allowed us to assess one potential cost of this defensive behavior. Harvestmen were paired with either a spider, another harvestmen, or nothing in arenas containing pieces of wet bread for 2 hours. Focal individuals were weighed immediately before and after the experiment. Individuals paired with spiders gained significantly less weight than individuals paired with other harvestmen or left alone. Our results suggest that the freezing behavior witnessed here may protect harvestmen from wolf spider attacks, but at the cost of reduced food/water intake.

Spiders in Paint Creek, a local wetland: initial findings in family composition and distribution

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The presence of spiders in terrestrial ecosystems has been studied extensively. Little is known, however, about the role of spiders in aquatic ecosystems, especially wetlands. The purpose of this study was to obtain a preliminary understanding of the spider community found in a local wetland, Paint Creek. Aerial and ground samples were collected along a 50-meter transect in a dense stand of native *Typha latifolia*. Samples were taken monthly from May to September, and were analyzed for both family composition and plant biomass. Initial findings indicate that spider communities in wetlands are highly variable. Ground samples yielded the largest number of individuals, high plant biomass yielded a diverse composition of spiders, and all variables changed with season. Overall, the family Lycosidae exhibited the highest abundance, followed by Clubionidae. Unexpectedly, the family Tetragnathidae exhibited the least number of individuals collected over the 5 month period. Continued sampling is needed to further understand the complex dynamics of spider communities in wetland habitats.

Global survey and inventory of Solifugae

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Solifugae, the sixth most diverse order of arachnids, are dominant predators in arid ecosystems on all major terrestrial landmasses except Antarctica, Australia, Madagascar and New Zealand. Despite their diversity, worldwide distribution, ecological importance, and remarkable morphology, behavior and life history, research on these fascinating arachnids has advanced little in 50 years. Many aspects of their biology remain unknown, fewer than ten researchers worldwide are presently studying any aspect of their biology, and publications on the group currently average only five per year. Given the paucity of active specialists, the situation will not improve until more are trained. Research is further hindered by a limited application of modern concepts and methods. The Global Survey and Inventory of Solifugae (http://www.solpugid.com), funded by the Biodiversity Surveys and Inventories program of the U.S. National Science Foundation, aims to reverse these negative trends and stimulate research on Solifugae as follows. (1) Fieldwork will be conducted in 13 countries in four regions of greatest known diversity to discover new species, document distributions, and gather fresh material for morphological, anatomical, behavioral and genetic studies. (2) The higher classification will be revised based on phylogenetic analysis. (3) Monographs on large monophyletic groups (three family-scale revisions) will be published. (4) Rigorous standards and modern techniques will be employed in research. (5) Collaborations will be forged among specialists currently working largely in isolation, and resources provided to expand their research. (6) New experts will be trained in traditional techniques as well as modern concepts and methods. (7) Results will be disseminated to the public via the internet. This project to resuscitate solifuge research, coordinated in North America but involving the world's solifuge specialists and arachnologists interested in diverse aspects of solifuge research in 17 countries, will invigorate solifuge research worldwide.

Galvanizing your specimens: unintended consequences of using green neoprene stoppers in alcohol based collections

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During an ongoing investigation of heavy metal occurrence in spider cuticle a few ethanol stored specimens showed anomalous zinc distribution. This was eventually traced to specimens stored in vials with green neoprene stoppers. Ethanol from vials with just a few years exposure to green stoppers contained zinc. Ethanol from vials stoppered with other common closures, including black, red and white rubber stoppers lacked zinc, even over an estimated time of several decades. Zinc salts, especially the oxide, are present in most rubber products since they are used as curing and filling agents, however only green stoppers appear to leach zinc into the ethanol. The overall effect of this zinc deposition on the specimens is uncertain. Zinc does have some antimicrobial properties so perhaps it could inhibit specimen decay. On the other hand, it can interfere with chemical analysis as in this instance, and possibly could interfere with other types of analysis.

Behavioral responses to the threat of predation in a mixed population of brush-legged and non-ornamented wolf spiders

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In a recently discovered population of *Schizocosa* wolf spiders, we find individuals comprised of two adult male forms, each with unique morphology and courtship displays - a non-ornamented form with a seismic only courtship signal and a brush-legged form with unique seismic and elaborate visual signals. Preliminary microsatellite data reveal no genetic distinction between these two male forms and thus the question remains as to what is maintaining the presence of both forms. Though brush-legged males are putatively more conspicuous, previous field studies showed no differences in over-all rates of predation on the two male forms. However, a measure of over-all predation rate can mask potential form-specific differences in predation risk, anti-predator behavior and/or predator-prey interactions. Here we conducted controlled laboratory experiments to investigate the details of anti-predator responses. We first compared the responses of each male form to predator silk and excreta cues. Overall movement time and likelihood of courtship was significantly greater in the absence of predator silk cues for both male forms but we found no form-specific differences. In a second experiment, we used live predator-prey interactions with a larger predatory wolf spider to examine the latency to and number of survived attacks. Again, we found no differences between the brush-legged and non-ornamented males for the latency to the first attack, the number of survived attacks, the latency to capture or capture rate. These experiments, in conjunction with our previous field study, suggest that there are no differential costs associated with predation from larger predatory wolf spiders

between brush-legged and non-ornamented males from this mixed population.

A comparison of the courtship behaviors of the funnel-web spiders *Barronopsis texana*, *Agelenopsis emertoni*, and *Agelenopsis aperta*

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Comparisons of sexual behavior among closely related species may elucidate phylogenetic relationships or may perhaps reveal strong sexual selection. The courtship of one *Agelenopsis* species, *A. aperta*, has been previously described in detail. Here we describe the courtship of another species in the genus, *A. emertoni*, as well as the courtship of a member of its sister genus, *B. texana*. Similar behaviors are observed in all three species, but the temporal patterning and frequencies of these behaviors differ. These differences and differences in overall activity level are described and discussed in light of phylogeny.

Do male *Schizocosa ocreata* (Hentz) wolf spiders respond to other courting males?

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Selection on males to locate females before other males may favor exploiting mate-searching efforts of others by "eavesdropping" on courting males. Male *Schizocosa ocreata* (Hentz) wolf spiders spend a large portion of their time searching for potential mates within complex forest leaf-litter, frequently courting in response to female silk draglines. Previous studies using both live males and video playback suggest that males do not exhibit social facilitation of courtship (i.e., respond to the courtship of others with increased courtship after exposure). However, these studies used males reared in isolation. Given that males occur in high densities in nature, it seems likely they encounter courting conspecifics often during the mating season. In this study, we test the hypothesis that prior experience and exposure in the field impacts the tendency of male *S. ocreata* wolf spiders to eavesdrop on conspecific males. Video playback studies with field-collected males demonstrated behavior consistent with eavesdropping, i.e. increased following and courtship behavior during and after exposure to a courting male stimulus. Studies also showed that when presented with two male video stimuli simultaneously, males interact more with images of courting males than of males walking on screen and spent more time in courtship display activity in proximity to the courting male video stimulus than the walking male. Follow-up studies using live spiders were more equivocal, and do not fully corroborate video results. While some of these results suggest experience may play a role in male behavior, it is at present unclear to what extent eavesdropping occurs.

Investigation of decision-making and transitivity of preferences in female choice of *Schizocosa ocreata* (Hentz) (Araneae: Lycosidae)

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When females evaluate potential mates, they may assess males using multiple criteria, and selection is expected to favor females that choose males based on increasing indicator trait quality, i.e., a fixed hierarchy of choices known as "transitive preferences". However, male characteristics may differ in the information they provide to females. In settings where multiple male traits are varied, females may weigh characteristics differentially and as a result violate hierarchical preferences, ultimately displaying what is known as "intransitivity". We studied decision-making in mate choice by female *Schizocosa ocreata* (Hentz) wolf spiders by testing hypotheses about transitivity of preferences for multiple criteria, including foreleg tuft size and courtship display rate, both of which may indicate male quality, but reflect success/fitness at different life stages. We used video digitization and playback techniques to modify male traits, and presented them to females in simultaneous choice combinations in a repeated-measures design. Females appear to exhibit transitive preferences for male signaling characters, but may display intransitivity in mate choice. This violation of expected hierarchies of preference may suggest a level of cognitive complexity through comparative evaluation of alternatives, rather than using fixed scales of measurement. Results suggest that some decision-making models of mate choice, which assume the use of fixed scales, may be inaccurate. Results will be discussed in the context of recent research on invertebrates that reveals previously unrecognized levels of flexibility and cognitive complexity in foraging and reproductive behavior.

Microbial fauna associated with the medically implicated hobo spider, *Tegenaria agrestis*, in the U.S. Pacific Northwest and their likelihood of causing infectious lesions

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In the Pacific Northwest (PNW), the hobo spider, *Tegenaria agrestis*, has been implicated as a spider of medical concern because the bite is thought to cause necrotic lesions. The hobo spider has rapidly expanded its range since its introduction into the PNW in the 1930's and has moved into neighboring states beyond the PNW. Although there are no verified published accounts, the hobo spider continues to be named as the causative agent for necrotic or infected lesions of unknown origin. Venom analysis does not show any known components that would induce tissue necrosis and the spider is not a medical concern in Europe, the originating country. Recent publications link necrotic lesions to a bacterial infection yet, the spider is still popularly considered as a bacterial vector although there is no evidence to substantiate this idea. Therefore, the next step in verifying the toxicity of the hobo spider bite is to identify the microbial fauna associated with this spider in order to establish whether or not there are pathogenic bacteria associated it. Exciting advances in molecular biology have introduced new tools that are available to determine bacterial biodiversity. Universal bacterial primers have become available to identify bacteria found in natural environments, some which are medically important. An ongoing examination the microbial fauna found on the medically implicated spider *Tegenaria agrestis* has begun using universal bacterial primers, 63f and 1389r for the polymerase chain reaction (PCR) amplification of 16S r RNA genes.

Preferences of novel and known prey types of the tarantula *Phormictopus cancerides*

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As sit-and-wait predators, tarantulas are opportunistic carnivores that rapidly attack and subdue a wide variety of prey moving within close proximity to their burrows or retreats. However, in a laboratory environment, captive-bred and raised tarantulas are more likely to have limited exposure to different prey. We examined prey capture and feeding behaviors of *Phormictopus cancerides* (Araneae: Theraphosidae) raised on a combination of both crickets and waxworms (Group 1) or crickets alone (Group 2). During feeding experiments individuals from these groups were offered waxworms, crickets, and cockroaches in separate trials. Thus, both groups were exposed to both novel and known prey items. We recorded feeding behaviors associated with each prey type including: 1) first movement towards prey; 2) first contact with prey; and 3) capture time. Within both groups, crickets were captured the quickest, often with no prior contact. Group 1, took the longest time to capture waxworms even though they had been fed waxworms prior to the start of trials. Differences in prey behavior and movement influences tarantula activity. Specific prey-handling behaviors associated with capture of novel and known prey are described in detail in the abstract by Shahin et al.

Are you paying attention? Female wolf spiders increase silk deposition when males don't court

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Female spiders use silk to advertise their receptivity to mate but little is known about variation in investment in silk to attract males or the context in which it is deposited. We measured variation in the quantity and type of silk deposited by virgin females of the wolf spider, *Pardosa milvina*, in the presence or absence of

males and among males that varied in their courtship intensity. We measured total female silk deposition, cord silk deposition, and attachment disk deposition on gridded sheets of paper in response to one of four treatments:1) an intensively courting male with access to female silk, 2) a weakly courting or non-courting male without access to female silk, 3) no male, but female silk present, and 4) no stimulus (control). Unmated females were placed under transparent petri dishes on paper grids within the centers of larger circular arenas. If males were present they were permitted to move about in the larger circle surrounding the female but had no direct access to the female for 30 minutes. After the trial period, the types of silk deposited on the grids were quantified. Females produced significantly more total silk in the presence of non-courting or weakly courting males but produced significantly less cord silk among non-courting or weakly courting males. We found no significant difference in attachment disk deposition across any treatments. Our results suggest that females invest more heavily in dragline deposition when encountering non-courting males and mediate their advertising investment based on male behavior.

I'm just not into you: Using forced mating experiments to untangle male and female mate choice in the wolf spider *Pardosa milvina*

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Female mate choice is often measured as receptive responses of females toward males and/or actual mating. However it is often difficult to determine if female choice is also driven by males choosing to show reduced courtship or interest in females because of male mate choice acting simultaneously. We sought to separate the relative contributions of male mate choice and female mate choice in determining mating success. We measured variation in courtship rates and duration among males that elicited female receptivity compared to those that did not. Then, using carbon dioxide we anesthetized females and paired them with either males they formerly accepted as mates or males that did not elicit female receptive responses. To measure copulatory efficiency and competency, we then measured the number of insertions, insertion rate, and missed insertions among force-mated females. We also measured egg sac production of females that force-mated with formerly accepted versus rejected males compared to control matings with unanesthetized females. Males that formerly failed to elicit receptive responses in females were significantly less likely to mount anesthetized females, suggesting that male mate choice may be involved in mating failures. Among formerly rejected males that did mate with anesthetized females, the insertion rate and number of missed insertions were no different than that of previously accepted males suggesting that once mounted, females do not modify their copulatory behavior toward previously rejected males and females don't choose males based on copulatory competence. Eggsac production was the same among formerly rejected and accepted force-mated females.

Ontogenetic and sex-specific differences in dragline and excreta deposition in the wolf spider *Pardosa milvina*

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Dragline deposition is common among most spiders but variation in silk production based on the age, sex, and reproductive status of spiders remains unclear for cursorial spiders. We measured the quantity and type of silk and excreta deposited in the wolf spider *Pardosa milvina*. We compared differences in silk and excreta deposition as a function of sex, developmental stage (penultimate instar versus mature), mating status (virgin or mated), and female reproductive status (eggsac or no eggsac). Field-collected *Pardosa* were allowed to move freely for four hours on individual grid-bearing 80 mm dia. paper disks. We then quantified cord silk and fine-gauge dragline silk coverage, number of attachment disks, and excreta produced on each sheet. Cord silk deposition did not vary across any group. We found significant differences in attachment disk deposition with adult females with eggsacs producing none, adult and subadult males producing very low levels, and adult mated females producing more than virgin females. Total silk deposition was significantly lower among eggsac-carrying females and highest among females immediately collected from the field. Surprisingly, we found no significant difference in silk deposition between mated and virgin females nor between adult males and unmated females. Eggsac carrying affects attachment and fine-gauge silk deposition but has little impact on cord silk. Excreta deposition showed significant differences between groups with adult virgin females and adult males producing the most and adult females with eggsacs the least. This suggests reduced feeding among eggsac-carrying females and high feeding rates among unmated females and adult males.

Effects of structural complexity and habitat switching upon the development of silk deposition behaviors in the wolf spider *Hogna helluo*

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All spiders produce silk draglines as they move through the environment. Wolf spider species that live in complex habitats exhibit greater development of the major ampullate silk glands and produce more draglines than species living in simpler environments. Although these studies suggest adaptations of the spinning-apparatus to habitat complexity, ontogenetic changes in dragline production as a consequence of habitat shifts within a species are lacking. We examined changes in silk deposition in the wolf spider, *Hogna helluo,* as a consequence of shifting habitats. *Hogna helluo* spiderlings were introduced to containers with either simple or complex environments. After one month, half of the spiders in each treatment were removed from their containers and transplanted to containers with the alternate environment type (simple or complex) while the remaining spiders were maintained in their existing containers. We quantified the amount of fine gauge silk, attachment disks, and cord silk as well as total silk deposition at one week intervals for the duration of the two month experiment. Silk deposition from spiders reared in each environment was measured on standardized gridded substrates. Significant increases in the quantity of attachment disks, cord silk and total silk over time were noted among all treatments. After two months, no significant differences in any of the four silk types measured were found as a function of habitat type, although a significant time by treatment interaction was noted for cord silk. These data suggest that silk deposition in *Hogna helluo* changes little in response to changing habitat types.

Inventory of the biodiversity and distribution of spiders on Nantucket Island, Massachusetts

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On Nantucket Island, Massachusetts, we conducted spider species inventories in five permanent Nantucket Biodiversity Initiative plots representing four major island habitats: barrier beach and dune, the globally rare sandplain grassland and coastal heathland, scrub oak and pitch pine (represented by two plots), and hardwood forest. We collected 2,509 spiders (859 adults and 1,650 juveniles or immatures) representing 26 families and potentially 217 species. Within the plots we followed standard timed one hour collecting methods including aerial and ground collecting, beat sheeting and sweep-netting. We also accepted spiders collected casually from anywhere on the island. Species richness curves suggest that our inventories are not complete for any of the sampled habitats and that more collection is needed. The species composition is only 31% similar to a historical island collection assembled by James H. Emerton in 1930. Our results are important for consideration in future management strategies especially those concerning the rare and intensively managed sandplain grassland and coastal heathland habitat. This study lays the groundwork for future studies investigating the effects of prescribed burning and plant community succession on Nantucket spider populations.

Intraguild predation by the black striped bark scorpion, *Centruroides vittatus* (Scorpiones: Buthidae) in the Tamaulipan Biotic Province at Laredo, Texas

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The function of intraguild predation (IGP) by the black striped bark scorpion, *Centruroides vittatus* (Scorpiones: Buthidae) is either as a form of predation or interference competition. Intraguild predation by *C. vittatus* included spiders (Araneae) and

solpugids (Solifugae) as prey on the campus of Texas A&M International University in Laredo, Texas. Other taxa that are potential members of the same guild as *C. vittatus* and were prey of *C. vittatus* included a mantid (Manotodea), centipedes (Chilopoda) and a harvestmen (Opiliones). Intraguild predation on *C. vittatus* was rarely observed except for cannibalism. The frequency of IGP by *C. vittatus* from September 2, 2003 to May 22, 2007 was 0.84% of scorpions observed (N = 2146) and 16% of scorpions with prey (N = 112). Future research will attempt to determine the function of IGP for *C. vittatus*.

Effects of hunger on female mate choice in *Schizocosa ocreata* (Hentz)

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Hunger can directly affect foraging, risk taking, and other behaviors. Recent studies with vertebrate models suggest that hunger level may also play a role in female mate choice, although sexually cannibalistic species like spiders may be subject to different conflicts and constraints. For example, female wolf spiders have been shown to exhibit mate choice based on male traits, but are often food limited in the wild and may also resort to sexual cannibalism. We studied the influence of hunger on female mate choice in *Schizocosa ocreata* (Hentz), using video playback to present a controlled male stimulus to females who were either food restricted or well-fed. As females assess males of this species on the basis of their secondary sexual characteristics (foreleg tufts), we also manipulated males (enlarge vs. reduced tufts) to determine the receptivity of starved vs. well-fed females. Overall, females exhibited receptivity more often to males with larger tufts. While there were no differences in latency to orient at male stimuli across treatment groups, length of time between orientation behavior and a female's first receptivity display varied significantly with tuft size in the well-fed treatment group, but not the starved group. However, females who were starved for longer periods did not discriminate between the different quality males. Aggressive behaviors were more frequent in hungry females, who were more likely to lunge at males, regardless of tuft size. Results suggest complex tradeoffs between natural selection and sexual selection in evolution of female choice behavior.

Biodiversity of spiders of Dominican Republic

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The spiders of Dominican Republic (DR) are virtually undiscovered. At the same time, DR is a unique place to study spiders and the history of spiders on the island and in the entire Caribbean region. This is because spiders are very common in the amber in DR. Amber found in the DR is extremely old. The oldest amber piece is around 30 million years old and this amber contains spiders inside which are also 30 million years old! But the paradox is that the spiders found in DR amber have never been found on the island in recent times. The question is why? There could be a few possible answers. For example, spiders that lived on the island 30 millions years ago are extinct on the island. Alternatively, spiders of the island are not well studied and we just lack information about the spiders currently inhabiting the island. Therefore, we started to study intensively the spiders of the DR beginning of year 2006 to try to find the answer to this question. In January 2007, we carried out a research expedition to DR for the purpose of study of the spiders. Our short expedition, only 12 days, demonstrated that in terms of biodiversity the spiders on the island are extremely diverse; we found new family of spiders on this island (Scytodidae), as well as new genera and new species.

Fine structural analysis of silk spinning apparatus in the spiderings *Araneus ventricosus* (Araneae: Araneidae)

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The fine structural characteristics of the silk spinning apparatus from postembryo to young instars of the spiderings *Araneus ventricosus* were studied using scanning electron microscope to reveal differentiation of its silk spinning tubes. In spite of the fact that the spiderings do not spin webs to trap a prey, they also have silk apparatus even though the functions are not fully defined. The spinning apparatus of the postembryo is the most primitive one which composed of only a pair of ampullate spigots at the anterior spinneret. No additional spinning tubes are not observed both of median and posterior spinnerets at this stage. First functional spinning system which composed of 3 complete pairs of spinnerets can be seen at the 1st instar after a molting of the postembryo. Anterior spinnerets comprise 2 pairs of the ampulate spigots and 10 pairs of pyriform spools. Another 2 pairs of ampulate spigots were also protruded on the middle spinnerets. Additional pair of "triad" spigots and 5 pairs of the aciniform spools were detected on the posterior spinnerets. Two aggregate spigots and a flagelliform spigot which have the function of sticky capture thread production in orb-web spiders were developed all of this spiderings regardless of their sex, characteristically. All of the spinning tubes of the spiderings were composed of the flexible basal segment and the slender spinning nozzle commonly.

Fine structural analysis of the spinning nozzle and duct for the dragline silk in the spider *Nephila clavata*

Jong-Gu Park** and Myung-Jin Moon
Dept. of Biological Sciences, Dankook Univ., Cheonan 330-714, Korea

The dragline silk of major ampullate silk gland possesses an exceptional combination of tensile strength and elasticity in the orb-web spider *Nephila clavata*. The spinning nozzles and the ducts of major ampullate gland were investigated to reveal the relationship between the fine structural characteristics and the mechanical properties of dragline silk fibers using light and electron microscopes. The major ampullate gland is composed of three functional parts, excretory duct, storage ampulla and convoluted tail regions. The external spinning nozzle is connected to the storage ampulla via the excretory duct. The duct is basically composed of three superposed types of the layers which are inner cuticles, monolayered epithelial cells and peripheral connective cells. By fine structural analysis, we could observe three subsutructures at the cuticle layer such as exocuticle, endocuticle and subcuticle. Among these, the electron lucent subcuticle which has the function of water absorption during silk polymerization is well developed at the anterior region near the nozzle of the spinneret. Whereas the endocuticles which contain banding pattern at the cross section are developed at the rest of duct region. The critical procedure for conversion of the liquid feedstocks into an insoluble silk seems to be accomplished at nozzle of spigot including the valve regions of anterior duct.

Competitive consequences of sociality in a behaviorally polymorphic population of the social spider, *Anelosimus studiosus*

Jonathan N. Pruitt & Susan E. Riechert
Department of Ecology and Evolutionary Biology, University of Tennessee. Knoxville, TN

The question as to why some organisms cooperate and why others do not has been a focal topic of evolutionary biology since the time of Darwin, yet little is known about the early stages of its evolution, when both a solitary and social phenotype persist in the species. This stage is paramount in the evolution of sociality as before the social phenotype can spread it first must out compete the selfish phenotype underlying the solitary lifestyle. If social individuals lack a phenotypic recognition mechanism, they likely compete at a great disadvantage. We investigate the competitive consequences of sociality in a behaviorally polymorphic population of the social spider *Anelosimus studiosus* (family: Theridiidae) by performing a series of staged encounters for a contested food item. Spiders were deprived of food for one week prior to encounters and pairs were released simultaneously onto a neutral web, foreign to both competitors and given 15 seconds to acclimate before a food item was dropped in the central portion of the web. Individuals scored as possessing a social phenotype took longer to approach the prey item, failed to capture prey items, failed to monopolize access to the prey whether they captured the prey item or not, and when contact was made with an aggressive individual either fled, or were injured and/or consumed. These findings suggest that early competition with non-cooperative conspecifics may be an intense early pressure against the evolution of sociality in some systems.

Take a hike: linear travel distance of male *Schizocosa ocreata* (Hentz)

Meghan A. Rector1, David L. Clark2, J. Andrew Roberts3, George W. Uetz4
1Department of Evolution, Ecology, and Organismal Biology, The Ohio State University, Columbus, OH; 2Department of Biology, Alma College, Alma, MI; 3Department of Evolution, Ecology, and Organismal Biology, The Ohio State University at Newark, Newark, OH; 4Department of Biological Sciences, University of Cincinnati, Cincinnati, OH

It is well established that male *Schizocosa ocreata* wolf spiders (Lycosidae) spend a significant portion of their daily time budget seeking potential mates. Little information exists however, concerning estimates of average travel distance for males during the spring breeding season. Males who travel greater distances are arguably more likely to encounter potential mates, but are also more likely to expose themselves to increased predation risk. As part of a long-term survey (2001 – 2005) of male behavior and activity patterns in the field, we measured linear distance traveled by individual males during ten-minute observation periods. Here we present data on average distance traveled by male spiders as a function of temperature, weeks elapsed from the start of the breeding season, and the time specific relative proportion of males to females in the population. Preliminary analyses show no evidence for a difference between the average distance traveled and collecting site, but do show evidence for a difference between the average distance traveled and weeks elapsed within season and between years of the study.

Energetic costs of web spinning in cobweb spiders

Raphael Royaute**, Peter H. Niewiarowski & Todd A. Blackledge
Department of Biology, University of Akron, Akron, Ohio

Web spinning spiders are used as a model system to investigate questions about foraging ecology and life history tradeoffs. The shapes of webs are relatively easy to characterize and compare between individuals or among species. However, almost nothing is known about the energetic costs involved in spinning webs. We report on preliminary investigation into the energetic costs of web production in the western black widow (*Latrodectus hesperus*) and the common house spider (*Achaearanea tepidariorum*). We use microbomb calorimetry to measure the material costs silk in different webs and respirometry to measure the costs associated with the spinning behaviors themselves.

Differences in prey-handling behaviors associated with novel and known prey in the tarantula *Phormictopus cancerides*

Sharif Shahin1, Brandon Neel1, Ryan Harper1 & Cara Shillington2
1Biology student, 2Department of Biology, Eastern Michigan University, Ypsilanti, Michigan

Predators use a diverse array of strategies to capture prey and, based on optimal foraging theory, should maximize their prey capture efficiency. Thus, predators should be able to discriminate between different types of prey and adjust behaviors accordingly. We examined prey capture and feeding behaviors in the tarantula *Phormictopus cancerides* using both novel and known prey items (see abstract by Harper et al.). Here we focus specifically on behaviors and prey-handling associated with different prey; both novel and known. Prior to the feeding experiments, tarantulas were separated into two groups. Group 1 was raised on both waxworms and crickets while Group 2 was raised on crickets alone. Novel prey items were thus cockroaches for Group 1 and both waxworms and cockroaches for Group 2. We observed differences in prey tracking and handling for each prey item and behaviors also varied depending on whether the prey was novel or not. Crickets were typically captured the quickest with minimal prior contact. Both groups spent more time investigating waxworms prior to feeding. This included many palpal touches and fangless strikes. In addition, strike speed was often slower than with other prey. Although cockroach movement was somewhat similar to crickets, tarantulas contacted the prey more frequently prior to capture. This contact was maintained for sometimes lengthy periods often leading to capture. In capturing cockroaches, fangs were most often inserted from prey's ventral surface. Random encounters were taped using a digital camcorder.

Influence of male foreleg pigmentation on female mate choice in the wolf spider *Schizocosa uetzi*

Paul S. Shamble1, Dustin J. Wilgers2 & Eileen A. Hebets2
Department of Integrative Biology, University of California, Berkeley, Berkeley, CA; 2School of Biological Sci., Univ. of Nebraska, Lincoln, NE

Males of the wolf spider *Schizocosa uetzi* possess pigmentation on the tibias of their first pair of legs that varies in both amount and darkness from individual to individual. Previous studies have shown this secondary sexual character to be condition dependent, as individuals raised on higher diets exhibited higher degrees of pigmentation. To determine whether or not females are using this information in mate selection we ran live mate choice trials using males that had been scored for pigmentation by eye and placed into three broad categories of light, medium, and dark. Qualitative analysis of these results suggests that females do not seem to be using this pigmentation as a criterion for mate choice. Upon completion of all trials, male forelegs were removed, mounted on slides, and digitally photographed in order to quantify pigmentation in a more quantitative fashion. Results of this analysis will be discussed. In addition, males were bled immediately following mate choice trials, and each sample was subjected to various immune assays in order to determine whether or not immune function is related to these secondary sexual characters. The results of these experiments will be discussed.

Do male wolf spiders advertise to females with dragline silk?: Variation in male silk deposition among *Pardosa milvina* in the presence of conspecific females and female silk

Kristen Shimmel1**, Jamie Havrilak1, Ann L. Rypstra2 & Matthew H. Persons1
1Biology Department, Susquehanna University, Selinsgrove, PA; 2Department of Zoology, Miami University, Hamilton, Ohio

It is well known that sexually receptive adult female spiders produce pheromone-laden draglines to attract prospective mates, but male spiders of many species also produce draglines and the role of this silk in sexual communication remains understudied. We measured total silk deposition, cord silk deposition, and attachment disk deposition of males over 30 minutes on gridded sheets of paper in response to four stimulus treatments (n=40/treatment): 1) silk from a virgin female coupled with a live virgin female that was outside a transparent petri dish in which the male was contained, 2) a live virgin female outside the dish, but no female silk available, 3) no female present, but virgin silk present, and 4) no stimulus present (control). Males produced significantly more total silk when a female was present along with her silk cues compared to any other treatment. Cord silk also significantly increased when female silk was present, irrespective of whether a live female was also present. Attachment disks also increased significantly when female silk and a live female were present together compared to when females were present without silk or the control group. Our results suggest that male silk deposition likely has a function in sexual communication and that the type of silk deposited varies considerably with the presence of visual and/or chemical information about the presence of a female.

Foraging and growth costs of habitat switching in the wolf spider *Hogna helluo*

Michelle M. Smith, Christopher A. Latanich & **Matthew H. Persons**
Biology Department, Susquehanna University, Selinsgrove, PA

The wolf spider *Hogna helluo* is a model species to study the effects of rearing environment and habitat switching on foraging performance and mortality. *Hogna* lives in agricultural fields which are subject to dramatic modifications within the lifespan of the spider. We randomly assigned 120 juvenile *Hogna* to two experimental habitat types (simple and complex). Habitat treatments varied only in their physical structure and consisted of plastic shoebox containers with either a topsoil substrate (simple) or topsoil with artificial grass and coffee stirrers on top (complex). For each habitat treatment, we collected data on spider foraging success including prey capture latency, growth rates, body condition, and mortality during a one-month period. We then divided each treatment into two sub-groups and randomly assigned half the spiders to the reciprocal treatment (simple or complex) while retaining half the spiders within their existing treatment. For one additional month we then measured the same variables again after habitat reassignment. *Hogna*

raised in more complex environments showed significantly longer prey capture latency initially as well as one month after introduction. Despite reduced prey capture success, we found no significant difference in spider body condition or growth rates among treatments prior to switching, but spider mortality was significantly higher in the complex habitat. Immediately after switching, spiders that remained in simple habitats had significantly better body condition than any other treatment. These data suggest fitness costs related to habitat complexity and asymmetry in the consequences of moving from simple to complex vs. complex to simple habitats.

Water repellent properties of spiders: topographical variations and functional correlates

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2Department of Biology, Univ. of Mississippi, University, MS 38677

We examined the water repellency of the surfaces of individuals from four families of spiders representing divergent lifestyles. For each spider, the ventral surface was first examined dry, then misted with an ultrasonic humidifier, and finally completely submerged in distilled water. A series of images was taken using a Nikon D100 camera connected to an Olympus SZX12 dissecting microscope with lighting provided by an electronic flash. As expected, *Dolomedes* (Pisauridae) and *Tetragnatha* (Tetragnathidae) have surfaces that are very hydrophobic. In contrast, only portions of the cuticle of *Larinioides* (Araneidae) are hydrophobic and the surfaces of the hirsute *Platycryptus* (Salticidae) are not conspicuously hydrophobic. We noted that several regions of the spiders' bodies, including the spiracles, book lungs, epigyna and palps, can have long curved hairs associated with them. These hairs typically are hydrophobic and appear to contribute to the maintenance of an air space over these structures; they may be important in protecting the underlying openings from dust and pathogens borne in free-standing water and in rain droplets or the splashes generated by rain. We have shown that water repellency not only varies widely among spider species but also within an individual across its ventral topography. We surmise that the support of respiratory and other functions by the hair-bearing cuticle is likely to have played an important role in the evolutionary history of spiders.

Behavior of the wolf spider *Schizocosa bilineata*

Rosanna Vaccaro** & J. Andrew Roberts
Department of Evolution, Ecology, and Organismal Biology, The Ohio State University at Newark, Newark, OH

In the spring of 2006, we began a survey of wolf spider species on the Newark Campus of The Ohio State University. A unique research opportunity arose when we discovered a number of males in the collection belonging to the species *Schizocosa bilineata*, first described by Emerton (1885). Males of this species bear dark tufts of bristles on their forelegs that likely play a role in mate selection as in other *Schizocosa* species. Though it belongs to a well studied clade of wolf spiders (Stratton 2005), the behavior of *S. bilineata* was unknown (Stratton personal communication). We collected additional male and female individuals in spring 2006 and 2007, set them up in the lab, and collected silk from females and males on filter paper to stimulate male behavior. Using digital video we recorded 10 minute segments of male behavioral response to female silk, male silk, and blank filter paper controls. Based on analysis of these videos we describe two new male courtship behaviors that have not previously been seen in this clade. We tentatively name these "quick tap" and "robot arm" and find evidence that these new behaviors are performed individually and in combination. Further, we compare male response to female and male cues from silk.

Role of juvenile male ornamentation in *Habronattus borealis* (Banks 1895) jumping spiders (Araneae, Salticidae) during agonistic interactions

Dustin J. Wilgers & Eileen A. Hebets
School of Biological Sciences, Univ. of Nebraska-Lincoln, Lincoln, NE

Agonistic encounters are prevalent throughout the animal kingdom and typically occur due to competition for resources such as food, space, or mates. During these agonistic encounters, stereotyped displays often function in opponent assessment, putatively decreasing the likelihood of contest escalation and thus decreasing the probability of injury. Many agonistic displays involve conspicuous ornamentation that may aid in the assessment of opponent characteristics (i.e. sex, age, size, condition). Males of the jumping spider *Habronattus borealis* exhibit red coloration on the clypeus solely during the later immature stages (antepenultimate and penultimate), losing the red coloration upon maturation. In order to determine any role this stage-specific ornament plays in conspecific interactions, such as agonistic encounters, we staged male-male, female-female, and male-female interactions combining two individuals of either the same or different life stages (immature/mature). We described and quantified all displays (agonistic, courtship) occurring throughout each trial. *Habronattus borealis* was found to exhibit a stereotyped agonistic display which involves both forelegs being extended above the prosoma and out laterally from the body. During interactions, males exhibited this display more frequently than females. We also found that agonistic interactions between mature males escalated to a greater degree and injuries to one male were more frequent than during any male-male interactions involving an immature individual, potentially suggesting that the red ornamentation may play a role in decreasing opponent aggression.

Student Paper Awardees

The Student Paper Competition at the Selinsgrove AAS Meeting produced many fine student presentations. The awardees were:

Podium Presentation—

First place was **Julianna L. Johns**, University of Cincinnati (with George Uetz & J. Andrew Roberts) for " Once bitten, twice shy? Aggressive male mating behaviors and fang use in the brush-legged wolf spider *Schizocosa ocreata*".

Second Place was **Maxim Larriveé**, McGill University (with Chris Buddle) for "Diversity of canopy spiders at multiple scales in hardwood forests of southern Québec".

Poster Presentation—

First place for the poster was **Emily Galbraith**, University of Cincinnati (with George Uetz, Stephanie Norton, J. Andrew Roberts) for "Investigation of decision-making and transitivity of preferences in female choice of *Schizocosa ocreata* (Hentz) (Araneae: Lycosidae)".

Second Place was **Kasey D. Fowler-Finn**, University of Nebraska-Lincoln (with Eileen Hebets) for "Behavioral responses to the threat of predation in a mixed population of brush-legged and non-ornamental wolf spiders".

Congratulations to the award recipients, and we look forward to the student presentations in Berkeley!

2007 AAS Election

This year we elected a new President-Elect and Director.

Our President-Elect is **Rosemary Gillespie** and the newest Director is **Greta Binford**, who replaces **Chris Buddle**. (We thank Chris for his two years of service!) **Karen Cangialosi** remains as Secretary.

This year (2008) we elect a new Director. Look for your ballot this spring.

Zoology Internship

The Lloyd David and Carlye Cannon Wattis Foundation Internship Program for Zoology at the Denver Museum of Nature & Science is intended to support projects involving use of DMNS Zoology Department collections. Zoology collections include Ornithology, Mammalogy, Entomology, Arachnology, and Conchology. More information about department holdings can be found at http://www.dmns.org/main/en/General/Science/Researchers/Zoology/.

Awards are for 1 – 7 months and range between $500 - $1,000. A final report summarizing the results of the project will be due upon completion of the funded activities.

Application Deadline is May 15, 2008. Please see attachment or contact Paula.Cushing@dmns.org for information.

Student Travel Award

The American Arachnological Society announces a student travel award to aid students attending this year's AAS Annual Meeting in Berkeley, California. This award is intended to provide partial support of up to $350 to undergraduate or graduate students who are presenting authors on a poster or presentation at the AAS meeting. Applicants must be members of AAS and have a demonstrated financial need that cannot be met by other sources (e.g. advisor, department or university).

To apply, please send an electronic version of the completed application form to **Dr. Greta Binford**: BINFORD@LCLARK.EDU. **The application form is attached and will also be posted on the AAS website at** WWW.AMERICANARACHNOLOGY.ORG

AMERICAN ARACHNOLOGY

is the official newsletter of the American Arachnological Society, and is distributed biannually to members of the Society. Items for the Newsletter should be sent to the Editor, Alan Cady, Dept. Zoology, Miami Univ.-Middletown, 4200 E. Univ. Blvd., Middletown, Ohio, 45042, USA,
Voice:(513)727-3258, Fax:(513)727-3450;
E-mail:CADYAB@MUOHIO.EDU.

All correspondence concerning changes of address and information on membership in the American Arachnological Society should be addressed to the Membership Secretary, Jeffery Shultz, American Arachnological Society, Dept. of Entomology, Univ. of Maryland, College Park, MD 20742; Voice:(301)405-7519, Fax:(301)314-9290, E-mail: jshultz@umd.edu.

Membership information may be found at the AAS website: http://WWW.AMERICANARACHNOLOGY.ORG. Members of the Society also receive the JOURNAL OF ARACHNOLOGY (published triannually) and have access to electronic resources (JOA OnLine).

You are cordially invited to attend the

24th EUROPEAN CONGRESS OF ARACHNOLOGY

25-29 AUGUST 2008
BERN, SWITZERLAND

The conference will be held in the university's historical main building, next door to the railway station. It is jointly organised by the University of Bern, and the Natural History Museum Bern, and supported by KCS Convention Service.

Bern is Switzerland's cosy capital, and a UNESCO Cultural World Heritage Site. It is located inside a loop of the Aare river that comes directly from the nearby Alps. This provides for both cultural and natural highlights, some of which can be explored during the conference. Although Switzerland is relatively expensive, the congress fee is comparable to former European Congresses. We are making all efforts to limit costs, e.g. by arranging private accommodation for students.

Conference contributions consist of talks, posters, photos, films, and books. The best posters and photos will be awarded. We especially encourage national and regional arachnological societies to present their organisation on a poster. Detailed information can be found at: http://www.esa2008.unibe.ch/

CALL FOR SYMPOSIA

We would like to invite you to organise symposia on topics such as behaviour, ecology, faunistics, methodology, physiology, systematics, taxonomy and toxicology of the different groups of arachnids. More specialised topics are welcome, provided that they attract a sufficient number of contributions. Please contact Wolfgang Nentwig with your suggestions by e-mail: wolfgang.nentwig@zos.unibe.ch

We look forward to a stimulating conference and sincerely hope that you will be able to participate! Please forward this message to anyone who may be interested.

Christian Kropf

Martin Schmidt

Wolfgang Nentwig

2008 AAS Annual Meeting

University of California

Berkeley, California

Wednesday, 25 June – Monday, 30 June

hosted by

Rosemary Gillespie & Charles Griswold

This year's AAS meeting will be held beside the campus of the University of California at Berkeley, founded in 1868. The UC Berkeley campus is home to a series of Natural History Museums, dating back to the early history of the institution: The Essig Museum of Entomology, the Museum of Vertebrate Zoology, the UC and Jepson Herbaria, the UC Museum of Paleontology, the Hearst Museum of Anthropology, and the UC Botanic Gardens. The city of Berkeley lies at the base of the Berkeley Hills, which rise steeply behind the campus (up to 535 m), and is traversed by the Hayward Fault, a major branch of the San Andreas Fault to the west. The city is well known for its vibrancy and liberalism, being the home of the 1960's Free Speech Movement. The city of San Francisco is well connected to Berkeley, and provides a rich array of cultural offerings. The California Academy of Sciences, currently closed as it moves to its new facilities, is scheduled to open later this year in Golden Gate Park. The new building, designed by renown architect Renzo Piano, includes a huge, undulating, and functional, living roof, which will slope over interior exhibitions and read as hills against the natural landscape. It will house an aquarium, planetarium, and exhibition spaces.

On campus housing: The Foothill Residence Halls offers suite style housing featuring single and double occupancy suites, as well as laundry facilities and lounges. The residence hall has the look and feel of a ski resort and provides a peaceful setting for meetings. All rooms are carpeted and furnished. Ethernet network connections are provided in every room allowing access to the internet and campus resources and free basic Cable TV. In-room telephone lines are also provided. The dining center for breakfast and lunch is in the same complex. Foothill has its own executive chef; menus include traditional favorites, ethnic specialties, vegetarian and vegan selections.

Nearby accommodations are available if you would prefer not to stay in dorm rooms. However, these tend to be expensive, with a limited number of small rooms.

Field Trips: Tilden Park Collecting Trip: Tilden Park is a local favorite that offers access to hiking trails in a mixture of habitat types including oak- woodland and redwood forest. The park is situated high in the Berkeley Hills, provides excellent views of the Bay Area, and features a botanical garden devoted to California endemics. Participants will be loaned basic collecting equipment and allowed to collect arachnids in specific areas of the park. Transportation will be provided. Those with the dorm/meal package will be able to pick up a meal free of charge before leaving for the field trip. All others need to make some other arrangement for lunch.

Napa Valley Winery Tour: The Napa Valley is one of the most famous wine regions in the world, and offers visitors access to more than 300 tasting rooms. We will be visiting 4 wineries on this trip, including St. Supéry, V. Sattui, Beaulieu Vineyards, and Rombauer all of which have won awards in recent years and are Napa favorites. Transportation will be provided, but please bring $5 per winery as they typically charge a small tasting fee. Those with the dorm/meal package will be able to pick up a meal free of charge before leaving for the field trip. All others need to make some other arrangement for lunch.

There also is a 'self-guided' option to visit the sights of San Francisco.

Air Travel: There are two large airports that serve Berkeley, San Francisco International airport (SFO) which is 25 miles from the UC Berkeley campus, and Oakland International airport (OAK) which is 15 miles away. From the airport there are two easy options for reaching the Berkeley campus: (1) the BART (Bay Area Rapid Transit) train that takes you to downtown Berkeley; and (2) the Bayporter Shuttle, a door-to-door van service. **Please see the AAS website (address below) for more travel information.**

Preliminary Schedule:

Wednesday, June 25th: Registration and informal mixer.

Thursday, June 26th: Talks; Poster Session.

Friday, June 27th: Talks; Informal Casual Arachnid Evening

Saturday, June 28th: Talks; Business Meeting; Banquet-Student Awards, Auction (Life Science Building)

Sunday, June 29th: Field Trips

Local Host Contact Information:

Rosemary G. Gillespie, University of California Berkeley, Division of Insect Biology, 137 Mulford Hall, Berkeley, CA 94720-3114; VOICE: (510) 642-3445; FAX: (510) 642-7428; E-mail: gillespie@berkeley.edu

Charles E. Griswold, Department of Entomology, California Academy of Sciences, 875 Howard Street, San Francisco, CA 94103; VOICE: (415) 379-5312; E-mail: cgriswold@calacademy.org

Please register and submit abstracts by the deadline:

19 May 2008

You will find all meeting information and registration at:

http://www.americanarachnology.org/AAS_Meetings/index.html

It is preferred that registration and abstract submissions be done through the website. However, registration and abstract submission forms will be available in the next Newsletter (coming very

ANNOUNCEMENTS

Information about

THE JOURNAL OF ARACHNOLOGY

Some exciting changes are happening to the Journal of Arachnology that will be implemented in 2008. First-a new format. The journal will be larger format (8.5 x 11 inches) and will have a color cover. The two column layout for text will be retained. The larger page size will permit better publication of large figures and tables.

Second, we have also decided to publish solicited review articles in the first issue of every year instead of the third issue. Unsolicited review articles are also welcome as submissions.

Just in case you have not noticed, we have completely caught up with the dreadful backlog of manuscripts that caused a delay in publication. Now, manuscripts accepted for publication in one year are typically being published that same year (unless, of course, they are accepted late in the year). Keep in mind that volume 36, issue 2 will be devoted to the ISA congress proceedings. Thus, expect issues 1 and 3 to be somewhat larger than normal to accommodate the non-Congress submissions.

In addition to being posted on the AAS website, JoA is also now being published via JSTOR and BioOne.

Finally, for those authors for whom figure numbering has always been a frustration, we now accept the following alternative figure numbering schemes:

Figures 1-4. A-us x-us, male from Timbuktu. 1, Left leg; 2, Right chelicera; 3, Dorsal aspect of genitalia; 4, Ventral aspect of abdomen. Scale = 1.0 mm.

The following alternate Figure numbering is now acceptable:

Figures 1a - e. A-us x-us, male from Timbuktu. a. Left leg; b. Right chelicerae; c. Dorsal aspect of genitalia; d. Ventral aspect of abdomen. Scale = 1.0 mm.

You may use either figure numbering scheme in your manuscript-just please be consistent throughout the manuscript (use one or the other numbering scheme but not both).

The newly revised Instructions to Authors are now posted on the AAS website and will be printed in volume 36.

Jim Carrel, Editor in Chief

Paula Cushing, Managing Editor

SPDIER COURSE

Stone Lab, Lake Erie

Rich Bradley will be offering a course this summer in basic spider biology at the Stone Laboratory on Gibraltar Island in Lake Erie. The intent of this course is to provide an overview of Ohio's spider fauna, an understanding of spider behavior, and an appreciation of the important role that spiders play in our environment. Students will be introduced to the diversity of spiders, their structure, behavior, and ecology. We will observe living spiders building their webs and capturing prey. A variety of field and laboratory equipment will be used to collect and identify spiders. We will learn the basic techniques of spider study (sweep nets, hand capture, pitfall traps, Berlese funnel extraction, etc.). The shores of Lake Erie are famous for both the abundance and variety of spiders. We will observe living spiders as well as study photographs and specimens of spiders to learn about their anatomy. Students in this course will learn how to identify spiders and become familiar with the fourteen most common spider families in Ohio.

The course runs from 3-9 August 2008, and is intended for upper-division undergraduates or graduate students. Information on the Stone Lab may be found at:
http://ohioseagrant.osu.edu/stonelab/

and a detailed description of the course is at
http://ohioseagrant.osu.edu/stonelab/courses/?course=52

Students not enrolled in a college program may still take the course under special arrangements (made through Stone Lab).

Rich Bradley – (bradley.10@osu.edu);(740) 725-6266; fax

The **ANIMAL BEHAVIOR SOCIETY's** 45th annual meeting will be held 16-20 August 2008 at Snowbird Ski and Summer Resort in the mountains of eastern Utah, 45 minutes outside of Salt Lake City. This is a gorgeous Rocky Mountain location, located in a dry mountain canyon with both alpine tree line and the desert floor with easy driving distance. It is centrally located in the Rocky Mountain West, perfectly situated for a family vacation. Our venue will be classic conference center/resort meeting rooms, i.e. ballroom or flat seating.

We have an exciting schedule planned, including a Plenary Address by **Mary Jane West-Eberhard** (University of Costa Rica) on the theme of *Alternative developmental pathways and why they are so important in behavior and evolution. This plenary* highlights issues in a companion symposium entitled *PATHWAYS TO NOVELTY AND DIVERSITY: THE CAUSES AND CONSEQUENCES OF POLYPHENISM* organized by David W. Pfennig, University of North Carolina and Armin P. Moczek, Indiana University. The meeting also features lectures by **Jerram Brown** (SUNY – Albany) on *Untold Tales About Mexican Jays* and **R Haven Wiley** (University of North Carolina, Chapel Hill) on *A Signal-Detection Equilibrium in the Evolution of Communication. The keynote speaker* will be **John Mitani** (University of Michigan), *The Behavior of Wild Chimpanzees.*

For further information see:

http://www.animalbehavior.org/Snowbird08/, or contact the designated host, Jeff Podos (jpodos@bio.umass.edu).

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AMERICAN ARACHNOLOGICAL SOCIETY WEBSITE

HTTP://WWW.AMERICANARACHNOLOGY.ORG

Ken Prestwich has developed our website where one may find membership information, **Annual Meeting Info & registration**, announcements & Bulletin Board, officers, meeting minutes, instructions to JOA authors, an electronic JOA index, graduate study opportunities, a photo gallery, links to other arachnological sites, and **JOA OnLine** (electronic versions of the Journal of Arachnology; available to A.A.S. Members). Many, many thanks and kudos to Ken for applying his time and skill to the Website!! Thanks too to Holy Cross for sponsoring the site.

ARACHNOLOGY IN CYBERSPACE

Here are some website addresses for arachnological information:

International Society of Arachnology—HTTP://WWW.ARACHNOLOGY.ORG
Arachnology Links—HTTP://WWW.ARACHNOLOGY.BE/ARACHNOLOGY.HTML
The Canadian Arachnologist—HTTP://CANADIANARACHNOLOGY.DYNDNS.ORG/

Spiders of North America — An Identification Guide

ORDER AT: HTTP://WWW.AMERICANARACHNOLOGY.ORG/SPIDER_GUIDE.HTML

AMERICAN ARACHNOLOGY
Department of Zoology
Miami Univ.- Middletown
4200 E. Univ. Blvd.
Middletown, Ohio, 45042

REMINDER ABOUT THE 2008 AAS ANNUAL MEETING !!!!

REGISTRATION AND ABSTRACT SUBMISSION DEADLINE IS MONDAY 19 MAY

REGISTER FOR THE 2008 MEETING AT:

http://www.americanarachnology.org/AAS_Meetings/index.html

See page 18 for more details