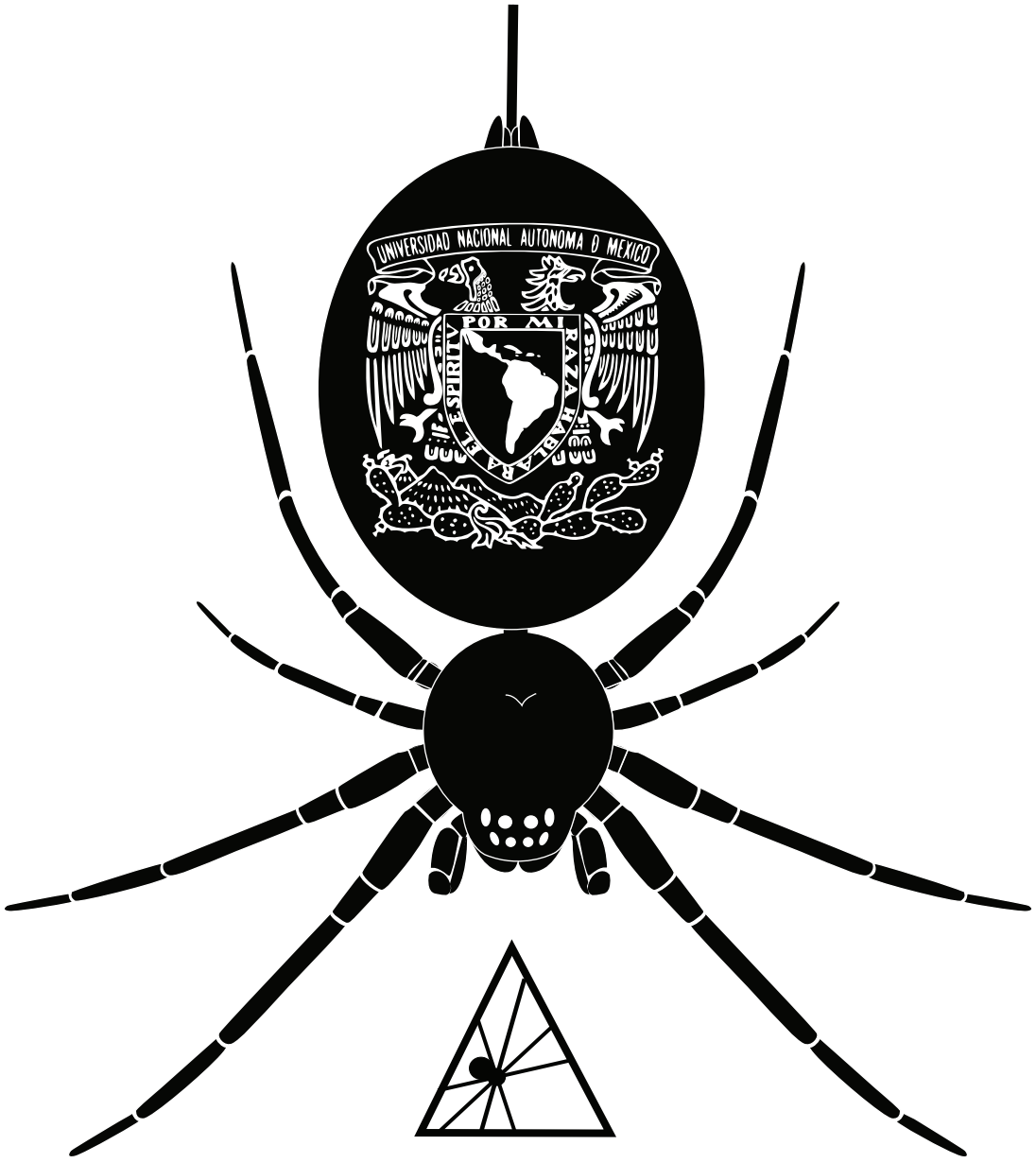
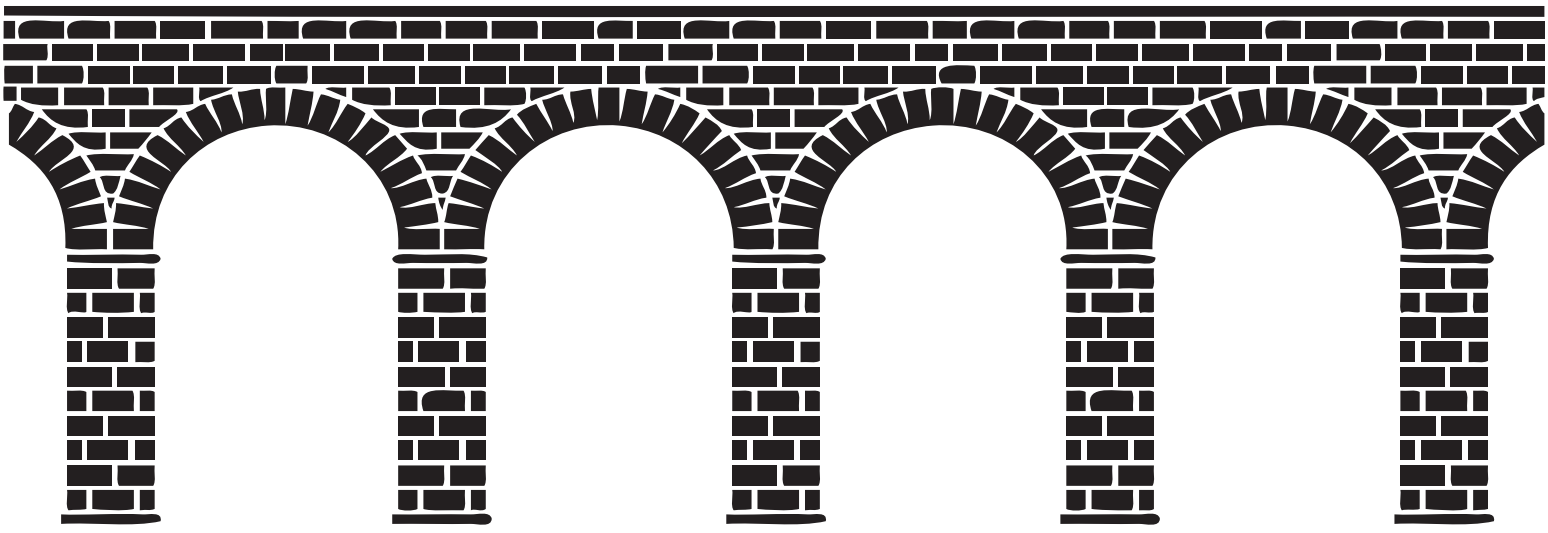
American Arachnological Society

2017 Meeting



Facultad de Ciencias UNAM *campus* Juriquilla



WELCOME

To the American Arachnological Society Meeting of 2017. This meeting will be held at the Centro Académico Cultural of The Unidad Multidisciplinaria de Docencia e Investigación, Facultad de Ciencias UNAM campus Juriquilla (UMDI-FC-J). This is a five day conference: first day for reception, three days of talks and last day for a field trip.

Attendees should plan to arrive Monday July 24th at the auditorium CAC of the Facultad de Ciencias UNAM. CAC stands for Centro Académico Cultural. Registration will be Monday 24th from 9:00 AM to 7:00 PM at the meeting venue. If you arrive after these hours your will be registered on Tuesday morning.

As a policy of UNAM it is forbidden to consume alcoholic beverages inside the campus. However, there are plenty of pubs around the Meeting venue where we can enjoy of a cold beer and continue our arachnid discussions.

Venue address: Unidad Multidisciplinaria de Docencia e Investigación. Universidad Nacional Autónoma de México. Facultad de Ciencias, Campus Juriquilla. 3001 Boulevard Juriquilla. Juriquilla, Querétaro, México. C.P. 76230.
Phone from USA (+52) (55) 56234324 Ext. 34324.
Phone from Querétaro (+52) (442) 1926224

Weather: Queretaro has an average altitude of 1,820 m (5,970 ft). The climate is dry to semi-arid with temperatures on July range from 25° to 37° C (80° - 100° F). Therefore it is recommended to be well hydrated and take it easy with the walking if you live at sea level.

Safety: Juriquilla is a safe town and the people are friendly. However some safety tips must be taken into account: 1) Avoid walking after dark. 2) If you are planning to travel at night, please consider Uber or a Taxi driver recommended by your Hotel. 3) Don't take random Taxis off the street. 4) Please avoid interacting with unknown or suspicious people and be aware of your surroundings.

For more information please email us at: aasjuriq2017@gmail.com

Note: * in Schedule and abstracts = Student Competition.

ACKNOWLEDGEMENTS

We would like to thank all the Officers of the American Arachnological Society for their comments, advise, sponsorship and the trust given to our lab for organizing this event. Special thanks to all the Arachnologists that kindly offered to help in the organization of this event at the Golden Colorado International Society of Arachnology congress. Thanks to Dr. Juan Morales Malacara for hosting this event at the UMDI-FC-J for Also, special thanks to all the graduate and undergraduate students that have volunteered as staff for this meeting.

MEETING SCHEDULE

		Monday 24th of July
9:00 AM		Registration of participants
2:00 PM		**Coffee and snacks break**
6:00 PM		Welcome Reception

		Tuesday 25th of July
9:00 AM		**Behavior and Physiology talks**
9:30 AM		EXPLORING SENSORY-BASED LEARNING IN AMBLYPYGIDS Hebets, E. A. Schoenberg, D. Perez, J.Fallick, M. & L. Segura-Hernández. Behavior
9:45 AM		THE ROLE OF VISION AND OLFACTION IN THE FORAGING BEHAVIOR OF *P. PSEUDOPARVULUS* (AMBLYPYGI: PHRYNIDAE) * Segura-Hernández, L. Barrantes, G.& E. Hebets. Behavior
10:00 AM		SHELTER DISCRIMINATION BY OLFACTION IN THE AMBLYPYGID *PHRYNUS MARGINEMACULATUS* Wiegmann, D.D. Moore, C. Keto, K. Hebets E. A. & V. P. Bingman. Behavior
10:15 AM		SENSORY DISCRIMINATION AND REFUGE RECOGNITION IN AMBLYPYGIDS Santangelo, C. R. M. & D. D. Wiegmann. Behavior
10:30 AM		IMPORTANCE OF THE ANTENNIFORM LEGS, BUT NOT VISION, FOR NAVIGATION BY THE NEOTROPICAL WHIP SPIDER, *PARAPHRYNUS LAEVIFRONS* Bingman, V. P. Graving, J. M. Hebets, E. A. & Wiegmann, D. D. Behavior
10:45 AM		**Coffee and snacks break**
11:45 AM		ARE WHIP SPIDERS (AMBLYPYGI) SENSITIVE TO THE EARTH'S MAGNETIC FIELD AS A POSSIBLE CUE FOR NAVIGATION? * Casto, P. Keto, K. Bingman, V. P. & D. D. Wiegmann. Behavior|
12:00 PM		COMBING THE SAND: USING A TEXTURAL FAMILIARITY ALGORITHM TO SIMULATE SCORPION NAVIGATION Gaffin, D. D. Behavior and Physiology
12:15 PM		PAIRED-WHEEL SCORPION TESTING APPARATUS * Daniels, M. & D. D. Gaffin. Behavior
12:30 PM		DECIPHERING SENSORY PROCESSING IN THE PECTINES OF THE STRIPED BARK SCORPION * Hughes, K. L. & D. D. Gaffin. Physiology

12:45 PM		BEHAVIORAL USE AND PHYSICAL CHARACTERISTICS OF DEFENSIVE SILK IN THE WESTERN BLACK WIDOW SPIDER *(LATRODECTUS HESPERUS*) Nelsen, D. R. Bonney, D. Delote, I. Young, W. Min, J. Lopez M. Wilson M. & A. Corbit. Behavior
1:00 PM		MOVEMENT AND SURVIVAL IN A SYNANTHROPIC POPULATION OF BROWN RECLUSE SPIDERS Cramer, K. L. Behavior
1:15 PM		INSECT DETECTION OF FLOWER-DWELLING CRAB SPIDERS Rodríguez-Morales, D. Ibarra Ajuria, H. Rico-Gray, V. García-Franco, J. G. Hernández Salazar, L. T & D. Rao. Behavior
1:30 PM		BIOCHEMICAL ADAPTATIONS OF OVERWINTERING SPIDERS * Potts, L. & N. Teets. Physiology
1:45 PM		**Lunch**
6:45 PM		Poster session

TIME		**Wednesday 26th of July**
9:00 AM		**Biodiversity and Ecology talks**
9:30 AM		THE COMPONENTS OF SPECIES DIVERSITY IN FORESTS AND OPEN HABITATS Bradley, R. Biodiversity
9:45 AM		A MULTI-TAXON CYBERDIVERSITY INVENTORY OF A SMALL CARIBBEAN ISLAND Miller, A. J. Stech, M. van Andel, T. Smit, J. de Winter, A. J. Colijn, E. Butot, R. Biesmeijer, K. Madden, H. & B. van der Hoorn. Biodiversity
10:00 AM		CIBERDIVERSITY OF PSEUDOSCORPIONS (ARACHNIDA, PSEUDOSCORPIONES) IN A TROPICAL RAINFOREST OF THE RESERVA DE LA BIOSFERA LOS TUXTLAS Piedra-Jiménez, D. F. & F. Alvarez-Padilla. Biodiversity
10:15 AM		OLD PAPERS, NEW DATA: APPLICATION OF DOCUMENT MARK-UP TO LIOCRANID SPIDERS (LIOCRANIDAE ARANEAE) * Rivera-Quiroz, F. A. & J. A. Miller. Biodiversity
10:30 AM		CYBERDIVERSITY OF ARANEOMORPHAE SPIDERS IN MEXICO (ARACHNIDA, ARANEAE) F. Alvarez-Padilla. Biodiversity
10:45 AM		**Coffee and snacks break**
11:45 AM		SPIDER DIVERSITY IN CLOUD FOREST OF CHIAPAS, MEXICO Ibarra-Núñez, G. Campuzano-Granados, E. F. Chamé-Vázquez, D. Maya-Morales, J. Gómez-Rodríguez, J. F. Angulo-Ordoñes, G. G. & H. Montaño-Moreno. Biodiversity
12:00 PM		A REVISION OF *EPICERATICELUS* (ARANEAE: LINYPHIIDAE) Milne, M. A. Draney, M. L. Ulyshen, M. & G. Madriz. Biodiversity

12:15 PM		PHYLOGENETIC ANALYSIS OF A NEW LINEAGE OF JUMPING SPIDERS (SALTICIDAE: SALTICINAE: AMYCOIDA) FROM COLOMBIAN ANDES * Muñoz-Charry, V. & W. Galvis. Biodiversity
12:30 PM		CONTRIBUTIONS TO THE MEXICAN SPECIES OF THE SPIDER GENUS ISHANIA CHAMBERLIN, 1925 (ARANEAE, ZODARIIDAE) Raña-Mendoza R. & F. Alvarez-Padilla. Biodiversity
12:45 PM		HOW CHANGES IN THE FLOW REGIME OF TROPICAL HEADWATER STREAMS EFFECTS THE DISTRIBUTION AND ABUNDANCE OF *WENDILGARDA CLARA* KEYSERLING, 1886 (THERIDIOSOMATIDAE: ARANEAE) * Kelly, S. P. Gutiérrez-Fonseca, P. E. & A. Ramírez. Predator/Prey Interactions
1:00 PM		MAPPING THE VARIATION IN SPIDER BODY COLOURATION FROM AN INSECT PERSPECTIVE Ajuria-Ibarra, H. Tapia-McClung, H. & D. Rao. Ecology
1:15 PM		DIVERSITY IN THE DIET OF THE MICROWHIP SCORPION (PALPIGRADI: EUKOENENIIDAE) FROM VAL VERDE COUNTY IN SOUTHWESTERN TEXAS AS REVEALED BY MOLECULAR ANALYSIS * Jones, M. Strenth, N. & L. McCutchen. Ecology
1:30 PM		BIOACCUMULATION OF HEAVY METALS WITHIN THE TERRESTRIAL COMPONENT OF A SALT MARSH FOOD WEB. Foellmer, M. & A. Vacca. Ecology
1:45 PM		**Lunch**
3:45 PM		Poster sessions
4:45 PM		Poster sessions
5:00 PM		Committee Meetings
6:45 PM		Committee Meetings

TIME		**Thursday 27th of July**
9:00 AM		**Systematics and Genomics talks**
9:30 AM		PHYLOGENOMIC ANALYSIS OF SPECIES LIMITS IN A DISPERSAL-LIMITED HARVESTMEN (*F. TRAVUNIIDAE*, THEROMASTER) FROM SOUTHERN APPALACHIA Hedin, M. Derkarabetian, S. & J. Starrett. Systematics
9:45 AM		PHYLOGENOMIC ANALYSIS AND REVISION OF THE TRAVUNIOIDEA (OPILIONES, LANIATORES) BASED ON ULTRACONSERVED ELEMENTS Derkarabetian, S. Starrett, J. Tsurusaki, N. Ubick, D. & M. Hedin. Systematics
10:00 AM		INTEGRATIVE SPECIES DELIMITATION IN THE THORN HARVESTMEN *ACUCALVELLA* (OPILIONES, ISCHYROPSALIDOIDEA) Richart, C. H. & M. Hedin. Systematics

10:15 AM		COSMETIDAE MISFITS: THE DISTINCT GENITALIC MORPHOLOGY OF *ERGINULUS* (OPILIONES: LANIATORES: GONYLEPTOIDEA) Proud, D. N. & V.R. Townsend, Jr. Biodiversity and Systematics
10:30 AM		**Coffee and snacks break**
10:45 AM		**Coffee and snacks break**
11:45 AM		FOUNDATIONS OF BIODIVERSITY STUDIES USING VOLUNTEERS AND PARAPROFESSIONALS: ARACHNOLOGY AT THE DENVER MUSEUM OF NATURE & SCIENCE Cushing, P.E. Systematics
12:00 PM		THE ORIGINS OF THE PSECHRIDAE: WEB-BUILDING LYCOSOID SPIDERS Piel, W. H. & D.-Q. Cheng. Genomics and Systematics
12:15 PM		GENOME-WIDE PHYLOGENETICS OF JUMPING SPIDERS (ARANEAE: SALTICIDAE) Maddison W. P. Systematics
12:30 PM		THE ROLE OF HABITAT CONNECTIVITY IN EXPLAINING PATTERNS OF GENOMIC AND MORPHOLOGICAL DIVERGENCE IN THE *HABRONATTUS TARSALIS* GROUP (ARANEAE, SALTICIDAE) * Boyer B. Systematics
12:45 PM		AAS BREAKING NEWS: ADDING FEATHERS TO THE FIREBIRD: MEXIGONUS EXPEDITION IN OAXACA AND CHIAPAS IN JULY 2017 Garcilazo-Cruz U. & W. P. Maddison Systematics
1:00 PM		RESOLVING PHYLOGENETIC RELATIONSHIPS AMONG PALPIMANOID SPIDERS USING TARGET ENRICHMENT TECHNIQUES Wood, H. M. Gonzales, V. & N. Scharff. Systematics
1:15 PM		MOLECULAR ANALYSIS OF GROUND SPIDERS (GNAPHOSIDAE) OF ASIA AND AUSTRALIA Shumskaya, M. Suarez, V. Vidas-Cruz, A. Zakharov, B. & V. Ovtcharenko. Systematics
1:30 PM		EVOLUTIONARY RESPONSES TO GRASSLAND EXPANSION IN THE SOUTH AMERICAN GHOST SPIDERS Ceccarelli, F. S. Mongiardino, N. Soto, E. M. & M. J. Ramírez. Biogeography
1:45 PM		**Lunch**
3:45 PM		Business Meeting (Attendance highly encouraged for AAS members)
4:45 PM		Business Meeting (Attendance highly encouraged for AAS members)
5:45 PM		VISIT TO UNIVERSIDAD AUTONOMA DE QUERETARTO ARACNARIUM
6:45 PM		VISIT TO UNIVERSIDAD AUTONOMA DE QUERETARTO ARACNARIUM
8:00 PM		**Meeting Banquet and Auction**

TIME		(Field Trip attendees only) Friday 28th of July
8:30		Pick up at a the Meeting venue
9:00		Departure to Tequisquiapan
10:00		Arrival at Tequisquiapan
11:00		Free time
11:30		Departure to La Redonda vineyards
12:00		Tour of the vineyard and wine testing
13:00		Free time
13:30		Departure to Bernal
14:00		Lunch at Gorditas El Negrito
15:00		Guided tour at Bernal
16:30		Departure at Quesos Vai
17:00		Tour at this cheese factory
18:00		Departure to Querétaro
19:00		Arrival to the Meeting venue

MEETING ABSTRACTS

MAPPING THE VARIATION IN SPIDER BODY COLOURATION FROM AN INSECT PERSPECTIVE

Ajuria-Ibarra, H. [1] Tapia-McClung, H. [2] & D. Rao [1]

1. INBIOTECA, Universidad Veracruzana, Xalapa, Veracruz, México. 2. Laboratorio Nacional de Informática Avanzada, A.C., Xalapa, Veracruz, México.

Colour variation is frequently observed in orb web spiders. Such variation can impact fitness by affecting the way spiders are perceived by relevant observers such as prey (i.e. by resembling flower signals as visual lures) and predators (i.e. by disrupting search image formation). *Verrucosa arenata* is an orb-weaving spider that presents colour variation in a conspicuous triangular pattern on the dorsal part of the abdomen. This pattern has predominantly white or yellow colouration, but also reflects light in the UV part of the spectrum. We quantified colour variation in *V. arenata* from images obtained using a full spectrum digital camera. We obtained cone catch quanta and calculated chromatic and achromatic contrasts for the visual systems of *Drosophila melanogaster* and *Apis mellifera*. Cluster analyses of the colours of the triangular patch resulted in the formation of six and three statistically different groups in the colour space of *D. melanogaster* and *A. mellifera*, respectively. Thus, no continuous colour variation was found. Significant differences were found between morphs for both visual systems in contrasts between the colour pattern, the area of the abdomen surrounding it, and a background of green foliage. Yellow spiders showed higher chromatic contrast than white spiders, while white spiders showed higher achromatic contrast. Therefore, there are perceptual differences between *V. arenata* colour morphs in the visual systems of potential relevant observers which could pose a selective pressure on this trait. We discuss these findings in the context of the sensory ecology of insect prey.

CYBERDIVERSITY OF ARANEOMORPHAE SPIDERS IN MEXICO (ARACHNIDA, ARANEAE)

Alvarez-Padilla, F.

Universidad Nacional Autonóma de México, Facultad de Ciencias, Lab. Aracnología. Circuito Exterior s/n Col. Copilco el Bajo, Del. Coyoacán. CP 04510 Ciudad de México, México.

The Order Araneae has approximately 47,000 described species, most of them included in Araneomorphae, and this number is estimated to represent only a fraction of the total. The spider fauna of tropical and subtropical regions has been barely sampled and contains most of these new species. Faunistic inventories in tropical and subtropical areas are also characterized by low percentages of identified specimens, and describing all new species for an entire inventory usually takes a very long time. This problem stops further comparisons with such as species distributions, phenotypic and genetic variations, etc. The idea of Cyberdiversity aims to overcome this time delay by sharing specimen data online taking advantage of the new digital, genomic and information technologies. In this talk it is discussed the importance of high resolution images databases presented as “morphospecies” web pages to share phenotypic data, regardless of their taxonomic status. Finally the illusion of a “magic script” that following simple rules could create these pages for any spider inventory is fantasized.

SOIL SPIDERS OF THE CLOUD FOREST IN THE BIOSPHERE RESERVE EL TRIUNFO, CHIAPAS, MEXICO

Angulo-Ordoñes, G. G. & G. Ibarra-Núñez

Colección de Arácnidos del Sureste de México, El Colegio de la Frontera Sur, Carretera Antiguo Aeropuerto km 2.5, Tapachula, Chiapas, México.

We studied the diversity of spider of the soil of two areas located on opposite slopes (north vs. south) with cloud forest at the Biosphere Reserve El Triunfo, Chiapas, Mexico. For the capture of spiders in both sites we established five transects and in each one we placed eight pitfall and collected four leaf litter samples over six months (one per month) including part of the dry season (February-April) and part of the rainy season (June-August) of 2014. There were a total of 2,139 specimens, from which 229 juveniles were identified only to family, and 1,910 identified to species or morphospecies: 556 females, 972 males and 382 juveniles, representing 22 families, 32 genera and 41 species. Linyphiidae was the most abundant family with 1,539 organisms (71.9%). The highest number of organisms was collected in the rainy season. New records were obtained for Mexico and Chiapas and six possible new species. The abundance of spiders was greater in site 1 (1072 versus 838). On both sites, the species *Walckenaeria* sp and *Agyneta* sp1 were dominant. A sampling completeness with a range of 76.6% to 89.8% was obtained using ACE and Chao1 estimators. The diversity profiles showed that diversity between sites was different (site 1: q0=44, q1= 12.7, q2=8.12 and site 2: q0=46, q1=8.12, q2=4.72), however, between seasons these values were similar (rainy: q0=44 q1=11.4, q2=6.6 and dry: q0=47, q1=10.65, q2=6.24).

UNDER THE INFLUENCE OF *HYMENOEPIMECIS HEIDYAE*

Barrantes, G. Segura-Hernández, L. Solano-Brenes, D. & P. Hanson

Universidad de Costa Rica, Escuela de Biología, Ciudad Universitaria, San José, Costa Rica.

Koinobiont-ectoparasitic wasps in the *Polysphincta* genus group (Ichneumonidae: Pimplinae) attack a large number of spiders across different spider families. The general rule is that these wasps induce spiders to construct highly modified webs that increase protection of the cocoon. Here we describe the larval behavior and the cocoon web of *Hymenoepimecis heidyae* on the spider *Kapogea cyrtophoroides*. The female wasp attached the egg to the mid-section of the dorsum of the spider abdomen. After emerging, the larva remained attached by its rear section to the spider abdomen. From this position the larva bit through the spider cuticle to feed on its hemolymph. Hours before the larva reached its last instar, it induced the spider to build the cocoon web, then killed the spider. The cocoon web consisted of a few thick silk threads that the spider added to the middle section of the already dense natural web, which makes it difficult to distinguish the cocoon web from the natural web. The larva attached its cocoon with multiple threads to the cocoon web. Our findings indicate that the design of the cocoon web correlates with the characteristics of the natural web: the cocoon web tends to be similar to the natural web when the latter is a long-lived, strong web.

IMPORTANCE OF THE ANTENNIFORM LEGS, BUT NOT VISION, FOR NAVIGATION BY THE NEOTROPICAL WHIP SPIDER, *PARAPHRYNUS LAEVIFRONS*

Bingman, V. P. [1] Graving, J. M. [2] Hebets, E. A. [3] & D. D. Wiegmann [2]

1. Bowling Green State University, Department of Psychology, Bowling Green, Ohio, USA. 2. Bowling Green State University, Department of Biological Sciences, Bowling Green, Ohio, USA. 3. University of Nebraska, School of Biological Sciences, Lincoln, Nebraska, USA.

Amplypygids, or whip spiders, are nocturnal, predatory arthropods that display a robust ability to navigate to their home refuge. Prior field observations and displacement studies in amblypygids demonstrated an ability to home from distances as far away as 10 meters. In the current study, micro-transmitters were used to take morning position fixes of individual *Paraphrynus laevifrons* following an experimental displacement of 10 m from their home refuge. The intent was to assess the relative importance of vision compared to sensory input acquired from the antenniform legs for navigation as well as other aspects of their spatial behavior. Displaced individuals were randomly assigned to three treatment groups : (i) control individuals-C, (ii) vision deprived individuals-VD, and (iii) individuals with sensory input from the tips of their antenniform legs compromised-AD. C and VD subjects were generally sucessful in returning home, and the direction of their movement on the first night following displacement was homeward oriented. By contrast, AD subjects experienced a complete loss of navigational ability, and movement on their first night indicated no hint of homeward orientation. The data strongly support the hypothesis that sensory input from the tips of the antenniform legs is necessary for successful homing in amblypygids following displacement to an unfamiliar location, and we hypothesize an essential role of olfaction for this navigational ability.

THE ROLE OF HABITAT CONNECTIVITY IN EXPLAINING PATTERNS OF GENOMIC AND MORPHOLOGICAL DIVERGENCE IN THE *HABRONATTUS TARSALIS* GROUP (ARANEAE, SALTICIDAE)

* Boyer, B.

San Diego State University, Department of Biology, 5500 Campanile Drive San Diego, California 92182.

Measuring habitat connectivity can be an informative approach when inferring population boundaries and explaining patterns of divergence and diversity among different taxa. In extreme cases, a lack of connectivity among populations results in isolation and subsequent divergence into new species. This study focuses on how patterns of habitat connectivity potentially explain genetic and morphological divergence among populations/species of the *Habronattus tarsalis* subgroup. The five described species in this group have been delimited through morphological characters, but molecular data for this group is lacking. Previous studies have found that the most widespread of the five species, *H. tarsalis*, has high variation in male ornamentation that appears to be correlated with geographic distribution. Morphological diversity seems particularly high among desert oasis populations found east of California's central montane spine, whereas habitats west of the central montane spine have widespread vegetation, and lower apparent morphological diversity. In this study, we quantify patterns of habitat connectivity using bioclimatic data, and relate this to patterns of morphological and genetic divergence (measured using ddRADSeq data). Preliminary work has found molecular support for the monophyly of this subgroup and identified morphologically unique populations that may be distinct enough to be considered new species.

THE COMPONENTS OF SPECIES DIVERSITY IN FORESTS AND OPEN HABITATS

Bradley, R.

Museum of Biodiversity, Ohio State University, 1315 Kinnear Road, Columbus, OH 43212-1157, USA.

As part of the Ohio Spider Survey (1994-2010) spiders were repeatedly sampled at a variety of focal sites. From these data I have chosen six forested sites and six open (old field/prairie) sites. Patterns of species diversity and co-occurrence were compared among sites. The components of diversity (alpha, beta, and gamma) were analyzed in the context of local habitat succession. Open habitats in this region represent an early successional stage, maintained by human management (primarily mowing or burning). I predicted that the pattern of beta diversity among sites at a later successional stage (forests) would be lower than for the early successional (open) sites. My reasoning is that forests are less frequently disturbed and might be expected to develop a definitive spider assemblage. Open habitats, due to frequent disturbance, would exhibit greater variation based on more episodic colonization events.

A MEXICAN SPECIES OF *WIRADA* KEYSERLING, 1886 (ARANEAE: THERIDIIDAE)

Campuzano-Granados, E. F. & G. Ibarra-Núñez

El Colegio de la Frontera Sur, Colección de Arácnidos del Sureste de México, Tapachula, Chiapas, México.

Wirada is one of the smallest and poorly studied genera of Theridiidae, with only five species known, all from South America. *Wirada* has been characterized by having carapace and sternum with scattered tubercles like setiferous “bridges”; tarsi as long as metatarsi; opisthosoma with dorsal and ventral scuta surrounding the pedicel; colulus replaced by two setae, hidden by a sclerotized ring around spinnerets; epigynum with two openings and two large spermathecae; male palp with a cymbial hook on the ectal margin pointing upward and the embolus base on the ectal side of the bulb. In 2011, Ibarra and collaborators be the first to report one specimen of this genus from a cloud forest of Chiapas, Mexico, and in 2016 Rivera-Quiroz and collaborators recorded another specimen from a tropical forest in San Luis Potosí, Mexico. Subsequent spider samplings (2014-2016) on three other sites of the Sierra Madre de Chiapas, revealed the presence of the first species in those localities, collected on the understory of cloud forests, at about 1800 to 2000 m altitude. The specimens from Chiapas comprise a new species (whose description is still in preparation) that differs from all other known species of the genus by the particular embolus shape of the male’s palp, straight and short and the inconspicuous cymbial hook, while in the females’ epigynum, the copulatory openings are on the anterior side of the atrium. The divergences in morphology suggest that this species constitute a different subgenus from South American species.

ARE WHIP SPIDERS (AMBLYPYGI) SENSITIVE TO THE EARTH'S MAGNETIC FIELD AS A POSSIBLE CUE FOR NAVIGATION?

* Casto, P. [1] Keto, K. [1], Bingman, V. P. [2] & D. D. Wiegmann [1]

1. Bowling Green State University, Department of Biology, Bowling Green, OH, USA. 2. Bowling Green State University, Department of Psychology, Bowling Green, OH, USA.

The surprisingly robust navigational behavior of Amblypygi has only recently captured the attention of researchers. Field studies suggest that amblypygids rely heavily on olfactory but not visual cues for navigation. Another source of navigational information for many animals is the earth's magnetic field. Might amblypygids also rely on magnetic field information for navigation? In a field study using small, powerful magnets fastened to the prosoma of *Paraphrynus laevifrons* we explored whether a disruption of the magnetic field impeded their navigational ability. These subjects performed as well as animals in a control group, fitted with a brass disc similar in size to the magnets for homing after displacements of 10 m. To examine more thoroughly the possible magnetic sensitivity of amblypygids, we explored the potential use of magnetic cues for goal recognition in a laboratory, experimental arena. Subjects were trained to discriminate between a shelter cued by a local change in the polarity and intensity of the ambient magnetic field and a shelter where the ambient magnetic field was unmanipulated. Preliminary results suggest that *P. laevifrons* is insensitive to the ambient magnetic field and geomagnetic information appears unlikely to be used for navigation.

EVOLUTIONARY RESPONSES TO GRASSLAND EXPANSION IN THE SOUTH AMERICAN GHOST SPIDERS

Ceccarelli, F. S.[1,2], Mongiardino, N.[3] Soto, E. M.[1,4] & M. J. Ramírez[1]

1. Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", División de Aracnología, Buenos Aires, C.A.B.A., Argentina. 2. Centro de Investigación Científica y de Educación Superior de Ensenada, Departamento de Biología de la Conservación, Ensenada, B.C., México. 3. Yale University, Department of Geology & Geophysics, New Haven, CT, U.S.A. 4. Universidad de Buenos Aires, Departamento de Ecología, Genética y Evolución, Buenos Aires, C.A.B.A., Argentina.

The earth's grassland biome only reached its maximum expansion relatively recently in geological terms, namely during the late Miocene/ Pliocene. The expansion of grasslands has had a profound effect on the evolution and diversification of specific organisms such as ungulate grazers. Cases of adaptations to grasslands can also be found among arthropods, as is the case in certain genera belonging to the spider subfamily Amaurobioidinae (Anyphaenidae), where a high proportion of species are found living in the grasslands of South America, with certain species even displaying morphological adaptations to dwelling inside the blades of the grasses. Here, we present a dated molecular phylogeny of the subfamily Amaurobioidinae, which in turn provides the backbone for further analyses that reveal the historical ecological and morphological processes behind these spiders' adaptations to grasslands. The multiple independent switches of several amaurobioidine lineages from forest to open habitats coincide with the expansion of South America's grasslands starting during the Miocene approximately 10 Ma. Similarly, morphological grassland adaptations appeared independently on at least three occasions, but only two of those clades converge towards a common morphology. Therefore, the spiders studied here as a whole subfamily, are among the organisms greatly favored by grassland expansions.

TWO NEW SPECIES OF PHRUROLITHIDAE FROM TACANA VOLCANO IN CHIAPAS, MEXICO

Chamé-Vázquez, D. & G. Ibarra-Núñez

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Phrurolithidae is a family of spiders with 14 genera and 218 species. Currently, there are twelve known species from Mexico: *Drassinella schulzefenai*, *D. gertschi, Phonotimpus eutypus*; *P. separatus*; *Phrurolithus adjacens*, *P. approximatus*, *P. coahuilanus*, *P. debilis*, *P. diversus*, *P. tamaulipanus*; *P. tepejicanus* and *Piabuna reclusa*. Some authors stated that many of the American species of Phrurolithidae are poorly known (i. e. very brief descriptions or only known from one sex) and some of them are misplaced. Through two spiders' surveys carried out in the Tacana volcano, Chiapas, Mexico, we discovered two new species of Phurolithidae that we think correspond to a new genus whose description is in preparation. Both species differ from other Phrurolithidae genera, except from *Piabuna* and *Phonotimpus,* because the males have RTA and DTA and the femur lacks a mid or distal knob, and the females by the combination of the following features: opisthosoma with dorsal scutum, PER recurved and PME smaller than the PLE. The males differ from *Piabuna* and *Phonotimpus* by having in the palp a membranous conductor and a "basal embolar process", the femur with a shallow concavity on the ectal side and a cluster of setae on the mesal side, while the females differ from *Phonotimpus* and *Piabuna* by having the atria closer to the epigastric furrow than in those genera. The vulvae in the new genus includes a pair of anterior bursae and spermathecae smaller than bursae. These findings show the need to increase the study of Phrurolithidae in Mexico.

SUBSTRATE DEPENDENT MATING SUCCESS OF *SCHIZOCOSA RETRORSA*

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An animal's signaling environment is known to influence the efficacy of its communication, and as such, is suggested to be a driving force in signal evolution. Insight into the extent to which the signaling environment influences signal form might be gained by focusing on taxa that signal across multiple environments. To that end, the wolf spider, *Schizocosa retrorsa*, can be found on multiple substrate types (i.e. pine litter, red clay, and sand) where they presumably court females with a display that is known involve multiple modalities including vibratory and visual signaling. Prior work revealed that (i) the transmission characteristics of the vibratory signal vary among substrate types, and (ii) the mating success is higher on the natural substrate, which also attenuates the vibratory signal the most. To explore this discordance, we compared *S. retrorsa's* courtship behavior and mating success on different substrates (leaf litter, pine litter, and sand) across light conditions (light and dark). In our experiment, neither male courtship nor mating success was dependent on light condition, but mating success was significantly higher on sand than on leaf litter. Our results suggest that (i) *S. retrorsa* courtship is substrate-dependent, and (ii) the visual component is not important for mating success.

MOLECULAR PHYLOGENETICS OF THE PSEUDOSCORPION TRIBE TYRANNOCHTHONIINI CHAMBERLIN, 1962 (CHTHONIIDAE) WITH A DISCUSSION ON THE BIOGEOGRAPHY OF THE *LAGYNOCHTHONIUS*/*TYRANNOCHTHONIUS* GROUP

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The pseudoscorpion tribe Tyrannochthoniini Chamberlin, 1962 (Chthoniidae) is defined as a Chthoniine group with coxal spines only on coxa II, lacking an intercoxal tubercle, trichobothria *ib* and *isb* in subbasal position on the dorsum of the chelal hand, spinneret absent or reduced to a sclerotic knob, and with the cuticle of anterior part of the carapace very thin (see revised diagnosis in Judson 2007). The tribe includes six genera: *Lagynochthonius* Beier, 1951, *Tyrannochthonius* Chamberlin, 1929, *Maorichthonius* Chamberlin, 1925, *Paraliochthonius*, Beier, 1956, *Troglochthonius* Beier, 1939, and *Vulcanochthonius* Muchmore, 2000. The most diverse genera within Tyrannochthoniini form the *Lagynochthonius*/*Tyrannochthonius* group that includes around 200 species and is globally distributed. While the coastal genus *Paraliochthonius* is also widespread, the remaining three genera have very small ranges: *Maorichthonius* is only found in New Zealand, *Troglochthonius* in the Mediterranean region, and *Vulcanochthonius* in Hawaii. As part of a larger chthonioid phylogeny, and in order to begin testing the monophyly of genera within Tyrannochthoniini, here we present a preliminary molecular phylogenetic analysis of four of the six genera based on five molecular markers. We also discuss biogeographic patterns of the globally distributed *Lagynochthonius*/*Tyrannochthonius* group.

MOVEMENT AND SURVIVAL IN A SYNANTHROPIC POPULATION OF BROWN RECLUSE SPIDERS

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The brown recluse spider (*Loxosceles reclusa*) is a common venomous spider in the south-central United States frequently found in buildings, sometimes at very high densities. Most arachnologists believe that this species is a very poor disperser. A building with a high density population may be found a few meters from a building with very few or no spiders. Such anecdotal evidence coupled with the fact that recluses are haplogynes that do not disperse by ballooning, and previous work showing that they are sedentary sit-and-wait predators (Cramer 2015), supports this idea but is not conclusive. This study followed nearly 100 individually numbered adult brown recluse spiders in an urban garage over one year. Every two to three days locations (to within 50 cm), mortality and "recapture" (re-sighting) of each spider were recorded and analyzed to evaluate frequency and distance of movements. Survival was also estimated using the program MARK for analyzing marked populations. Only one spider was observed after more than one year, and two spiders (both males) were encountered in an adjacent structure. Survival appears markedly lower than that reported in earlier lab studies.

FOUNDATIONS OF BIODIVERSITY STUDIES USING VOLUNTEERS AND PARAPROFESSIONALS: ARACHNOLOGY AT THE DENVER MUSEUM OF NATURE & SCIENCE

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The Arachnology collection and program at the Denver Museum of Nature & Science (DMNS) was established in 1998 when Paula Cushing was hired as the Curator of Entomology. Her title quickly morphed into the Curator of Insects and Spiders and then into the Curator of Invertebrate Zoology. In 1999, she initiated the Colorado Spider Survey (CSS). The DMNS arachnology collection began with two significant donations: from Bea Vogel, first president of the AAS and a transfer of arachnids from the Colorado State University arthropod collection. Specimens donated from other colleagues, from Cushing through her own fieldwork, and through CSS participants have grown the collection from near-zero vials in 1999 to over 50,000 vials (over 37,000 of which are identified and databased) 18 years later. The DMNS arachnology data has been online-accessible since its inception. Cushing established an efficient system for specimen processing, curation, and identification by training and utilizing the skills, dedication, and enthusiasm of paraprofessionals recruited through the CSS. Today's presentation will provide an overview of how this collection was established and has grown into one of the major collections housed at the DMNS largely through the support of teams of paraprofessionals.

PAIRED-WHEEL SCORPION TESTING APPARATUS

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The mechanisms of scorpion navigation are barely studied, despite applications in robotics and assistive technology. We are testing the path integration (PI) hypothesis, in which an animal keeps track of the distance and direction of its travel by comparing it to a predictable reference, so that it can return to a burrow. Specifically, we want to test the effects of polarized UV light and geomagnetic fields on scorpion PI, since these stimuli may be PI references. To facilitate easier testing of scorpion PI, we designed an apparatus that tethers a scorpion on top of two 22.9 cm diameter, 2.65 cm wide wheels that rotate freely so that the animal is held in place while able to walk. Small patches of Velcro hold the scorpion to the tether. When the scorpion walks, its legs rotate the wheels, with each wheel rotating independently of the other. The movement of the wheels are recorded by two USB laser mice (one per wheel) affixed 1 mm from the side of each wheel, so that movement can be quantitatively and automatically recorded. The paired-wheel setup is superior to a container-based experimental area because no edges or corners are presented to the animal. We are currently using the device to test the effect of UV light on the orientation of scorpions on the wheel.

PHYLOGENOMIC ANALYSIS AND REVISION OF THE TRAVUNIOIDEA (OPILIONES, LANIATORES) BASED ON ULTRACONSERVED ELEMENTS

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The Travunioidea is an early-diverging lineage of laniatorean harvestmen with a Laurasian distribution having species distributed in eastern Asia, eastern and western North America, and central Europe. This clade has had a challenging taxonomic history, but the current classification consists of ~77 species in three families – the Travuniidae, Paranonychidae, and Nippononychidae. The classification of the Travunioidea has traditionally been based on structure of the tarsal claws of the hind legs. However, it is becoming increasingly clear that tarsal claw structure is not an ideal character for use in defining taxonomic groupings due to homoplasy at all taxonomic levels. Here, we utilize an arachnid-specific probeset targeting 1120 ultraconserved elements (UCEs) to reconstruct the phylogenetic relationships of the Travunioidea. Data matrices consisting of 100s of loci were used in maximum likelihood, Bayesian and species tree analyses. Resulting phylogenies recover three consistent and highly supported clades. The phylogenetic position and taxonomic status of the enigmatic genera *Trojanella* and *Yuria* are less certain. Based on the resulting phylogenies a revision of Travunioidea is proposed, now consisting of the Travuniidae, Paranonychidae (Nippononychidae is synonymized), and the new family Occimastridae. In addition, the general utility and costs of the UCE method will be discussed in relation to arachnid phylogenetics.

SPIDERS FROM ARID ZONES OF THE WORLD

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Arid and semi-arid regions cover about 41% of Earth's land surface. Spiders are the most important predators in these regions and this is one of the reasons why knowledge about their ecology and distribution has become relevant in the last years. In this study we conducted a bibliographical research on spiders found in arid environments of the world. We analyzed and compared the specific richness (S), and grouped the areas according to the Jaccard index. The highest richness was found in the Oasis of Baja California del Sur, and the Cuatro Ciénegas basin in the Chihuahuan desert, while Southern Sinai (Egypt) and Isluga Volcano National Park (Chile) had the lowest richness with 16 and 9 species. The classification resulted in four clusters: a) the arid regions of Chile, b) the areas of the Chihuahuan Desert in the United States of America, c) the Mexican araneofauna, and d) the arid regions of Asia. The differences in richness and composition can be explained by environmental factors such as vegetation and rainfall but also by the methods used to collect the specimens.

COMPARISON OF TOXINS MASS FROM THE VENOM OF FOUR *POECILOTHERIA* SPECIES AND VARIOUS TERRESTRIAL TARANTULAS

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Tarantulas (Araneae: Theraphosidae) are a family of 958 spiders distributed worldwide, with both terrestrial and arboreal hunting behaviors. Venoms from tarantulas comprise a mixture of highly selective toxins designed for hunting and defense purposes. Peptide toxins constitute the major component of these secretions and act modulating specifically various isoforms of voltage-gated ion channels, while proteins act as spreading factors. However, molecular weight from peptides and proteins between arboreal and terrestrial tarantulas venoms has never been compared. The aim of this study was to analyze the mass distribution of toxins from the venoms of both kinds of tarantulas through mass spectrometry and electrophoresis. SDS-PAGE analysis revealed an intense band conserved in all venoms analyzed at approximately 40 kDa. Mass spectrum through MALDI-TOF exhibited 57 ions with molecular mass between 2-8 kDa for terrestrial tarantulas and 82 ions with molecular masses between 1-8 kDa for arboreal tarantulas. Interestingly, the major content of ions for both groups was between 4-5 kDa; no ions below 2 kDa were detected for terrestrial, whereas 10 ions were detected within 1-2 kDa for arboreal species. This study demonstrates that our group of arboreal tarantulas produced venoms with more toxins than the terrestrial group, and that the major expression of peptide toxins is presented in a range from 4-5 kDa for both groups. Interestingly, a 40 kDa band is conserved in all analyzed venoms. Because arboreal tarantulas venoms are more potent than terrestrial, research should be conducted to find what components are responsible for such potency.

NEW RECORDS OF JUMPING SPIDERS (ARANEAE: SALTICIDAE) FROM HUASTECA POTOSINA, MEXICO

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The jumping spiders are the most diverse family worldwide, currently with 5,851 species; however, the information about its biology is limited, mainly from tropical and subtropical forest in North America. For Mexico have been recorded 278 species, meanwhile for San Luis Potosí there are 30 species of 16 genera recorded so far. The objective of this work is to present new records of jumping spiders from San Luis Potosí. We collected spiders from three municipalities of Huasteca Potosina: Tamasopo, Ciudad Valles and Rio Verde, at 2015 and 2016 during the dry season (March-June) and rainfall (September-December) of each year. The collections were performed during day and night about 3 hours, beating net and frame methods were used, and the spiders were placed in vials with ethanol 80% and transported to the laboratory. Furthermore, spiders deposited at the arthropods collection of the Escuela nacional de Ciencias Biológicas since 2010 to 2016 were used like comparative material. The organisms were identified using keys and an online database available. Were found 298 individuals, of which 79 are new records of the species: *Bagheera prosper, Habrocestum acerbum, Habronattus agilis, Ilargus coccineus, Messua* sp*., Mexigonus minutus, Neon* sp*., Nycerella delecta, Phidippus johnsoni, Platycryptus undatus, Sitticini* sp., *Zygoballus nervosus,* and *Zygoballus sexpunctatus*. Four species were most abundant: *Z. nervosus* (19)*, Z. sexpunctatus* (15)*, N. delecta* (14) and *Neon* sp. (12) that represent almost 76%. Records of species in a locality are important because new information is added to the knowledge of diversity from Mexico was provided.

BIOACCUMULATION OF HEAVY METALS WITHIN THE TERRESTRIAL COMPONENT OF A SALT MARSH FOOD WEB

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Investigating the effects of environmental and ecological degradation caused by the discharge of toxic pollutants is of paramount importance to assess overall ecological health, especially in heavily modified and impacted systems, such as the wetlands of the South Shore Estuary of Long Island, NY. We determined the level of heavy metals available within the environment, as well as their accumulation in the invertebrate trophic system with wolf spiders (*Lycosidae*) as the top predators. Sediments, marsh grass (*Spartina alterniflora*), planthoppers (*Prokelisia sp.*) and wolf spiders (*Pardosa littoralis*) were analyzed for the following heavy metal loads: Hg, Ni, Cu, Cr, Zn, Cd, Pb and Ag. We sampled four distinct salt marsh patches along an assumed pollution gradient in Hempstead Middle Bay, originating from a major sewage effluent discharge. We found significant accumulation of zinc, copper, silver, cadmium and mercury in *P. littoralis*, supporting the hypothesis that heavy metal contaminants move from the aquatic to the terrestrial components of wetlands and bioaccumulate within the invertebrate food web.

CYBERDIVERSITY OF THE FAMILY LINYPHIIDAE (ARANEAE, ARANEOIDEA) IN TWO MEXICAN ECOSYSTEMS

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The spider family Linyphiidae is the second most diverse lineage of Araneae, including more than 4,000 species grouped in 600 genera; however, it is estimated that the total number exceeds 12,000 species. In Mexico, 88 species grouped in 22 genera have been recorded, which represent 1.9% of the world fauna. In the last decade, faunistic work has been responsible for much of the total increment of species number. For Mexico, these studies have contributed to the knowledge of spider diversity; nevertheless, they have identified on average only the 52% to the collected species. The Cyberdiversity approach attempts to resolve the difficulties inherent of megadiverse taxa with poorly taxonomic documentation. Its main contribution is the distribution of high resolution images online that allow comparisons between species regardless of their taxonomic problems. In addition, combines these data with the implementation of collecting standardized protocols, DNA sequencing and other biodiversity resources available online. The present faunistic inventory apply the tools provided by the Cyberdiversity to the Family Linyphiidae in two Mexican ecosystems. Standardized collecting methods were applied in remnants of two oak forests near to Pico de Orizaba Volcano and a wet tropical forest in San Luis Potosí State. A total of 4,664 specimens has been sorted to ca. 54 morphospecies documented with nearly 700 high resolution images available at www.unamfcaracno-lab.com. Species richness and seasonal variation will be estimated and analyzed to each locality.

COMBING THE SAND: USING A TEXTURAL FAMILIARITY ALGORITHM TO SIMULATE SCORPION NAVIGATION

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Arguably, scorpions have the most elaborate “tongues” on the planet. The paired ventral combs called pectines sweep the ground as the animal walks. Each of the many pectinal teeth supports tens to hundreds of peg-shaped sensilla called pegs. Each peg is supplied with 10+ chemosensory neurons and at least one mechanosensory neuron. By their anatomy and physiology, the pegs are best classified as taste structures. Males use the pectines to detect female pheromones during the limited mating season, but females have pectines too. I have long wondered what additional roles the pectines could play; why are there so many pegs? I am taking a computational approach to assimilate all we know about pecten biology to test the hypothesis that scorpions use their pectines to navigate by chemo-textural familiarity. The premise is that scorpions use their pectines to acquire matrices of chemo-tactile information while moving toward a goal. Then, during retracing runs, the animal moves in a direction that minimizes the pixel-by-pixel difference between its current pectinal “taste” and the taste matrices it has in memory. We have developed a simulation of an autonomous agent that successfully navigates complex training paths based on this familiarity algorithm. We used high contrast photography of the animal’s sand habitat to generate a visual proxy for the substrate’s texture. We found that even though our landscape is devoid of chemical information, the high number of closely spaced pegs allows the simulated animal to retrace tortuous paths without getting lost.

RICHNESS OF SPIDER SPECIES AND GUILDS (CHELICERATA: ARANEAE) IN COFFEE CROPS, IN SAN MATEO PIÑAS, OAXACA

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To know how a community of spiders is structured, you can be grouped into guilds according to the strategy by which they get their food. The objective of this study was to obtain the spider richness as well as the structure of the spider communities through their classification in guilds in coffee plots with different crop management in San Mateo Piñas, Pochutla, Oaxaca. Two plots of coffee were sampled, one with the application of agrochemicals (conventional management) and the other without the application of these compounds (traditional management). Sampling was performed every two months from January to May 2014 for two days per collection period for each plot. A total of 369 individuals were collected, distributed in 30 families and 93 genera. The best represented family was Theridiidae with 16 genera, followed by Araneidae (13) and Salticidae (9). In the traditional treatment coffee plot, more stalking spiders were obtained (46), followed by orbicular net weavers (44) and irregular net weavers (35). In the conventionally treated coffee plot, a greater number of orbiting net weaver spiders were obtained (35), followed by irregular net weavers (33) and stalks (32). The plot with traditional management had a greater wealth of families (26) and genera (65) than conventional coffee (23 families, 58 genera). The dominance of weaver spiders and stalkers indicates that coffee agroeco-systems have a very homogeneous landscape, which facilitates the establishment of these families.

AAS BREAKING NEWS: ADDING FEATHERS TO THE FIREBIRD: *MEXIGONUS* EXPEDITION IN OAXACA AND CHIAPAS IN JULY 2017

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A couple of weeks before the AAS conference took place in Juriquilla we went on an expedition to find new species of jumping spiders of the genus *Mexigonus* in the states of Oaxaca and Chiapas. Our main objective was to understand better the diversity of the genus, as only four taxa have been described, and evidence from collections suggests many more exist. Our second objective was to find more specimens of rare species with red faces, with the intention of finding their position in the phylogenetic tree. If their elusiveness or eyes surrounded by beautiful carmine scales weren't seductive enough for spider-hunters, the mechanism that allows them to see this color is of much interest in understanding the evolution of vision. But pursuing a particular species of spider has its challenges. The seasons when specimens are adults are not fully understood yet, and changes in the landscape could have even made a species face premature extinction. This makes focused targets real prizes and motives of celebration, as there probably won't ever be many specimens in collections, giving these creatures a sense of rareness typical for creatures studied in the realm of Cryptozoology. The legend of the firebird starts with the finding of an unexpected glowing red feather that reveals the existence of a creature and an object of a difficult quest. It represents therefore an excellent analogy for the intentions of the present expedition. Did we catch the firebird?

TAXONOMIC REVISION OF THE GENUS *ANICIUS* CHAMBERLIN, 1925 (ARANEAE: SALTICIDAE)

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Anicius Chamberlin, 1925 is an endemic genus of jumping spiders from Mexico, with a known distribution in the states of Jalisco and Michoacan. The only described species is *Anicius dolius* Chamberlin, 1925. Since its description no new species have been described and there isn't a taxonomic study that tests the monophyly of the genus. The revision of *Anicius* specimens from Colección Nacional de Arácnidos del Instituto de Biología, UNAM; Colección Aracnológica de la Facultad de Estudios Superiores Zaragoza, UNAM and the Museum of Comparative Zoology, Harvard allowed us to find four new species and perform the taxonomic revision of the genus. In this revision, we redescribed *Anicius* and the type species *A. dolius*, five species are recognized in the genus, including four new ones. The monophyly of *Anicius* was validated by a cladistic analysis with 78 morphological characters. One most parsimonious tree was found (L = 68 steps, CI = 0.765 & RI = 0.789). The monophyly of *Anicius* is supported by a combination of seven characters and 99% values of Jackknife and Bootstrap. Finally, as result of spatial analysis we add the states of Chiapas, Mexico, Guerrero, Hidalgo, Morelos, Oaxaca, Puebla, Tamaulipas and Veracruz to the known distribution of *Anicius*. In addition, we created three maps of the actual distribution of the genus in relation to altitude, weather and floristic divisions, and one map with potential distribution of the genus in Mexico. The new information generated by GIS shows that *Anicius* distribution pattern corresponds biogeographically with the Mexican Transition Zone.

PHYLOGENOMIC ANALYSIS OF SPECIES LIMITS IN A DISPERSAL-LIMITED HARVESTMEN (F. TRAVUNIIDAE, THEROMASTER) FROM SOUTHERN APPALACHIA

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We used a combination of morphology, mitochondrial DNA sequence data, sequence-capture of 100s of ultra-conserved element loci (UCEs; Starrett et al. 2016), and 100s-1000s of ddRADSeq loci to investigate species limits in Theromaster. While multiple analyses of UCE and RADSeq data agree in the recovery of primary lineages, these lineages are not recovered in phylogenetic analysis of mitochondrial data, showing again that mitochondrial only studies should always be questioned. We show that UCE data have utility at shallow phylogenetic levels in arachnids. RADSeq lineages occupy mostly exclusive geographic distributions, with evidence for riverine barriers playing a role in lineage divergence, as found in prior studies of southern Appalachia taxa. In eastern Tennessee and southwestern Virginia we show that distinct RADSeq lineages correspond to linear ridges, a relatively novel biogeographic finding for the region. Multispecies Coalescent (MSC) analyses of RADSeq data recover multiple lineages as species, although we argue that some of these hypothesized species-level lineages reflect MSC over-splitting, because of the panmixia assumption. Via comparison of male genitalic and cheliceral morphology with UCE and RADSeq genomic lineages, we conservatively estimate that this genus includes 3 new species.

EXPLORING SENSORY-BASED LEARNING IN AMBLYPYGIDS

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Compared to insects, amblypygids possess exceptionally large and elaborately folded paired regions of the central nervous system that are hypothesized to function in learning, memory, and sensory integration (i.e. mushroom bodies). In line with this unique neuroanatomical structure, laboratory-based learning assays have previously demonstrated the capacity for amblypygids to learn tactile cues. Additionally, field-based sensory manipulation experiments suggest that olfaction is important in nocturnal homing behavior in amblypygids. Building upon each of these findings, we conducted laboratory-based learning assays using distinct olfactory cues. As predicted, we found that amblypygids of two different species are capable of olfactory learning. Next, we explored whether amblypygids were capable of higher-order learning. Specifically, we tested the capacity for amblypygids to learn “sameness” and “difference” using stimuli from two different sensory modalities – texture and smell. Preliminary results suggest that amblypygids are indeed capable of learning higher-order concepts and that this learning is facilitated by their enlarged mushroom bodies.

DECIPHERING SENSORY PROCESSING IN THE PECTINES OF THE STRIPED BARK SCORPION

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Scorpions have two comb-like, abdominal appendages called pectines that detect chemical and physical stimuli. Pectines are composed of thousands of sensory structures called peg sensilla arranged on ground-facing teeth. Each sensillum is highly innervated to receive stimuli and transmit neural impulses to the scorpion's brain. These neural impulses have been monitored in the peg sensilla, but no one has ever recorded from the first relay station in the scorpion brain. Previous morphological studies suggest that the neural organization at the point where the pectinal nerve enters the posterior brain reflects the arrangement of teeth on the pectines, therefore conserving the location of the detected environmental stimuli. We are using electrophysiology to detect the electrical signature of sensory neurons that supply the pectines. We recorded near the insertion point on the spine of the right pecten while stimulating three spots on both pectines. We saw a difference in the spikes while stimulating the right side compared to the left. Right side stimulation produced small spikes that appear to be sensory activity milliseconds before motor feedback, whereas left side stimulation showed motor feedback, but no small spikes. We also recorded from the pectinal nerve in the abdominal cavity. We found two distinct action potential patterns in baseline activity; one spike appears to enhance the activity of the second spike. Eventually, we want to record electrical activity where the pectinal nerve enters the brain to assess how information from the pectines is represented at that level.

SEX AND DECEPTION: EXPLORING THE ROLE OF SENSORY EXPLOITATION IN THE COURTSHIP DISPLAY OF THE MALE PANTROPICAL JUMPING SPIDER *(PLEXIPPUS PAYKULLI)*

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Complex courtship displays have long perplexed behavioral ecologists. Why do males often possess elaborate ornaments that seemingly surpass the requirements for successful courtship? Sexual cannibalism in arachnids may better illuminate this issue. Male jumping spiders must simultaneously court females and avoid predation. How, then, do males traverse the precarious boundary between sex and death? They may employ a fascinating tactic to avoid cannibalism: using bold colors or patterns to exploit female sensory bias against similarly-colored aposematic prey. The Pantropical jumping spider, *Plexippus paykulli*, exhibits sexual dichromatism wherein males possess bold black and white stripes, a pattern which has been shown to elicit aversion responses in other taxa. If this motif acts as pseudo-mimicry of aposematic prey, we predict that this species will avoid attacking non-toxic prey with black and white stripes (P1), and that females will be less aggressive toward striped males compared to males with experimentally concealed stripes (P2). Here, we tested the first prediction (P1) with prey choice trials in which spiders were offered striped or non-striped termites (*Reticulitermes flavipes*). Spiders were introduced to termites adorned with striped or grey paper capes and recorded for 15 minutes. Once a termite was captured the trial ended and the color of the termite was recorded. Videos were analyzed to document the latency of attack and the number of times the spider oriented toward, approached, and probed termites. Preliminary data suggest that spiders capture grey termites more often than striped termites, thus setting the stage for testing our second prediction (P2).

SPIDER DIVERSITY IN CLOUD FOREST OF CHIAPAS, MEXICO

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Cloud forests are known by harboring a high diversity of plants and animals, including many endemic species. Study of spiders in cloud forest has been very scarce, mostly limited to a few sites in Indonesia, Tanzania, Peru, Costa Rica and recently Mexico. The Sierra Madre de Chiapas is a mountain range that goes parallel to the Mexican Pacific coast and includes several sites with cloud forest. From 2007 to 2016 we made a series of surveys to study spider diversity in four sites (inside three Biosphere Reserves) with cloud forest (1,800 to 2,050 m. a. s. l.) from the Guatemala border to the northwest: Tacaná volcano, Cerro Boquerón, El Triunfo and Cerro Bola. In each site, we made systematic samplings of spiders from soil and understory layers, with pitfall traps and leaf litter revision for soil, and by sweeping, beating and visual sampling for the understory. The largest sample was from Tacaná (10,164 specimens) and the smallest from Cerro Bola (6,263). Higher diversity was found in Tacaná (151 species) and Cerro Bola (about 144), and lower diversity in Cerro Boquerón (about 108) and El Triunfo (106). Endemism was higher for sites with lower richness (Tacaná 25%, Triunfo 40%). We found a considerable number of new species, some of which were shared between sites. Linyphiidae and Theridiidae were the richest families in all sites, but in Cerro Bola the Araneidae added to these. Results are yet in analyses, but to date they reveal characteristic spider faunas for this scanty known habitat.

DIVERSITY IN THE DIET OF THE MICROWHIP SCORPION (PALPIGRADI: EUKOENENIIDAE) FROM VAL VERDE COUNTY IN SOUTHWESTERN TEXAS AS REVEALED BY MOLECULAR ANALYSIS

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The order Palpigradi are a poorly known group of arachnids found in caves and soil from numerous localities worldwide. Prior and preliminary studies have suggested arthropods and cyanobacteria as possible diet items of these organisms. This current study uses DNA sequencing to identify contents of the digestive tract. Three universal primer sets were used to target the COI region, 16S rRNA, and the ITS region. These primers had been previously designed to specifically target arthropods, cyanobacteria, and fungi respectively. Additionally, a blocking primer was designed and used to limit the palpigrade DNA itself so as not to obscure the relatively tiny amounts of food DNA present in the gut. Nine specimens of *Eukoenenia* sp. were collected near the Devil's River in Val Verde County of southwest Texas. DNA from these specimens was extracted, amplified by PCR, and then sequenced using an Illumina MiSeq platform. Sequences were compared to the NCBI GenBank and Barcode of Life Database (BOLD). Species level identification has been made for multiple species of arthropods and higher taxonomic identification is made for bacteria and fungi sequences through statistical analyses. These results further support a generalist diet for this species.

HOW CHANGES IN THE FLOW REGIME OF TROPICAL HEADWATER STREAMS EFFECTS THE DISTRIBUTION AND ABUNDANCE OF *WENDILGARDA CLARA* KEYSERLING, 1886 (THERIDIOSOMATIDAE: ARANEAE)

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The species *Wendilgarda clara* Keyserling, 1886 (Theridiosomatidae: Araneae), is a specialist of tropical aquatic ecosystems. These spiders spin simplified web structures that include a couple of structural bridge lines between rocks and vegetation along streams with various lines that are then attached to the water surface to snare insects (e.g., water striders) that float by in the current. Due to their close connection with aquatic ecosystems the distribution and abundance of these spiders will be most likely effected by any physicochemical or morphological changes to the stream. Headwater streams in oceanic islands, such as the Greater Antilles, are known to have "flashy" flow regimes due to steep drainages and large amounts of rainfall. However, climate change projections throughout the Caribbean predict longer periods of severe drought to become more common and this will result in significant changes to the flow regime of island streams. The objective of this study is to determine how changes in the flow regime of headwater streams in Puerto Rico effects the abundance and distribution of *W. clara* and their principal prey, *Rhagovelia sp.* (Veliidae: Hemiptera). We conducted monthly samplings along two head water streams within the Luquillo Experimental Forest in northeastern Puerto Rico. In addition to sampling for *W. clara* and *R. sp.* we also collected data for stream discharge and other physicochemical and morphological information. As severe droughts become more common in Puerto Rico it is critical to determine how organisms will respond to changing climate patterns and how it could impact predator-prey interactions.

CHANGES IN WEB STRUCTURES OF TETRAGNATHID SPIDERS ASSOCIATED WITH A SEVERE DROUGHT

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Webs of orb-weaving spiders are physical manifestations of animal behavior that are easily observed and quantified. Variations in web structures have been linked to a variety of abiotic and biotic changes and therefore could be used as indicators in how web-spinning behavior is altered due to changes in their surrounding environment. Our objective in this study was to measure how web spinning behavior in a family of orb-weaving spiders (Tetragnathidae: Araneae) varies among species and how it is impacted by several weather patterns. Sampling was conducted from June through August during 2015 and 2016 within the Luquillo National Forest in northeastern Puerto Rico. We photographed the webs of adult females of six species representing four genera of tetragnathids. We recorded web height, web angle in the field and later measured another seven structures of each web by analyzing the photographs with the computer software Imagej. A PCA test was then used to determine which web variables were the major contributors to variations in web structures among taxa and among sampling periods. Web structures varied greatly between species, but there was less variation among species within the same genera. There were also significant differences in four of the eight web variables measured between 2015 and 2016. Differences in web variables between sampling periods may be associated with a severe drought that occurred in 2015. By continuing to sample these species annually we will be able to show how the web spinning behavior of tetragnathids can be influenced by changing weather patterns.

SPIDER DIVERSITY OF THE FAMILY THOMISIDAE (ARANEAE, DIONYCHA) IN REMNANTS OF MEXICAN QUERCUS FORESTS

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Thomisidae is the seventh most diverse family of spiders including 2,159 species divided in 174 genera. In Mexico, has been recorded 59 species and 14 genera for this family. These spiders are characterized by the conspicuous laterigrade leg arrangement and their ability to associate with a wide range of flower species to capture preys, using visual and tactile cues. In the present study, we conducted a faunistic inventory inside two remnants of Quercus forests near to Pico de Orizaba Volcano using as basis the methods and tools suggested by the Cyberdiversity approach. Standardized collecting protocols were applied inside four plots of one hectare each, with beating and direct collection being the most important for this group. A total of 41 specimens were collected and have been sorted in ca. nine morphospecies, of which seven are represented by only one individual. Diversity analyses include estimations of species richness and seasonal variation between the plots. In addition, these morphospecies were documented with standardized high resolution images available at www.unamfcaracnolab.com. Finally, to contribute to the knowledge of mexican fauna, the new species discover in the present study will be described.

A PRELIMINARY PHYLOGENETIC ANALYSIS OF THE SPECIES COMPLEX *MESOMEXOVIS OCCIDENTALIS* (VAEJOVIDAE, SYNTROPINAE) BASED ON QUANTITATIVE AND QUALITATIVE EVIDENCE

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The species of the *occidentalis* complex is distributed along the Pacific coast from Jalisco to Chiapas. Two studies sketched this complex (Hoffmann 1931, Sissom 1989), but Gonzalez-Santillan & Prendini (2013) suggested that due to its distribution, *M. occidentalis* may represent a species complex. Herein, we present the first phylogenetic analysis of this species complex based on morphologic characters. We scored 157 qualitative and quantitative characters, the former included: coloration, carination and ornamentation and the latter: macrosetal counts of metasoma and pedipalps and measurements of the carapace, pedipalps, tergites, metasomal segments and telson. Sampling of quantitative character systems included five males and females per terminal, when possible. Phylogenetic analyses were carried out with the program TNT under the parsimony criterion. Additionally, analyses with: equal and implied weights, and standardized, discretized and original quantitative characters were explored. Our preferred topology was retrieved under implied weighting and original quantitative characters because was retrieved by all concavity values in a majority rule (50%) consensus tree. Our results indicate that the *occidentalis* complex comprises at least seven well-supported, morphologically discernible lineages that putatively are diagnosable species. Further analyses of molecular data, distribution and ecological traits are needed before the creation of new species.

GENOME-WIDE PHYLOGENETICS OF JUMPING SPIDERS (ARANEAE: SALTICIDAE)

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Recent studies using hundreds to thousands of genes from across the genome have refined considerably our understanding of salticid spider phylogeny. A study on the relationships of salticid subfamilies and tribes using Anchored Hybrid Enrichment to target a sample of about 500 gene regions has both resolved some puzzling relationships and corroborated previous results. Some intertribal relationships remain unclear, however. At a finer scale, transcriptomes of 34 species of *Habronattus* and 2 outgroups have given the first species-level phylogeny based on genomic data in salticids. The 1877 loci give strong support to most clades, but at the same time reveal extensive hybridization, sometimes among distinct species groups, in this clade known for distinctive and complex courtship behaviour. While genome-wide data will continue to provide a much sharper lens on salticids' genetic history, at the same time it is reassuring to see that its results are largely concordant with previous work, including morphological.

A COMPARATIVE APPROACH TO UNDERSTANDING COMPLEX SIGNALING

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Complex animal communication is a taxonomically widespread phenomenon. However, approaches to understanding why animals produce complex signals have largely been taxon specific, limiting the ability to generate and test broad evolutionary hypotheses. We have adopted a systems approach to understanding the evolution of complex signaling, focusing on how structure and function relationships of a signaling system change under different conditions. We aim to determine a) the degree to which different components of a signaling system serve the same function (degeneracy), b) whether degeneracy increases the robustness of the signaling system and c) whether degeneracy constrains or facilitates the evolution of the signaling system. This framework is currently being applied to the complex courtship displays of more than 20 species of North American *Schizocosa* wolf spiders. We are characterizing the structure and function of these species-specific courtship displays under varying conditions and then mapping them onto a new phylogenetic framework. We hope that this approach can be applied to future animal communication studies across diverse taxa and signaling systems.

FOSSIL SPIDER ASSEMBLAGE FROM MEXICAN AMBER: INSIGHTS INTO ANCIENT CHIAPAS SPIDER DIVERSITY

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The Mexican state of Chiapas comprise an important and recognized Amber Lagerstatten with extremely well preserved material from a wide variety of taxa. At the present, several species of arthropods, such as ants, spiders, scorpions, pseudoscorpions and millipedes have been reported or described from several localities in Chiapas, but the species diversity of the locality is yet to be discovered. As a result of an extensive collection effort from 2014 to date, several amber inclusions of spiders have been recovered and a preliminary taxonomic inventory is provided. Material came from Simojovel, Estrella de Belén and Totolapa localities and comprise a set of 33 amber inclusions of spiders from at least seven families, being Salticidae the family with more richness, although several spider weavers, such as araneids and theridiids are also present. Since several specimens constitute adult forms, the formal identification and species description are in process, but this collection effort reveals the great underlying diversity of ancient Mexican spider fauna that is yet to be discovered.

THE FAMILY SALTICIDAE BLACKWALL 1841, IN MORELOS, MEXICO: A FIRST PRELIMINARY TAXONOMIC INVENTORY

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Among spiders, the family Salticidae is the most diverse group representing more than 12% of all spiders described. Currently, the family comprises 625 genera and 5,950 species, grouped in seven subfamilies, 30 tribes and 13 subtribes. Mexico hosts nearly 280 species, but the diversity of the family is clearly underestimated, since there is expected that only in Chiapas State the jumping spider diversity will be as greater as the U.S.A. salticid diversity. This represent an enormous challenge to Mexico and, in order to contribute to the knowledge of this family in the country, we carried out several collection trips along the state focusing in Salticidae, covering mainly central and south Morelos and the Sierra de Huautla Biosphere Reserve (REBIOSH). To date we report 19 genera and 22 species, from which 13 species represent new records for the state and one species, *Leptofreya ambigua* (C. L. Koch, 1846), as a new record for the country. Making the total diversity of jumping spiders for Morelos state of 22 genera and 37 species, although more collections in the state may increase the richness. This is the first preliminary taxonomic inventory of the Salticidae (and, to our knowledge, of any spider family) in Morelos state.

THE EFFECT OF PLANT GENETIC DIVERSITY OVER THE SPIDER COMMUNITY STRUCTURE IN A TROPICAL DRY FOREST IN MORELOS, MEXICO

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The effect of plants over spiders are a topic extensively studied and it´s known that spiders can be affected directly by individual plant phenology, morphology and architecture, or in a community level by plant diversity, richness, abundance and composition; however one approach that is poorly studied is how plant genetic diversity can affect spiders communities. Foundation species are well known as modifiers of the community and ecosystem by creating stable conditions for other communities, so even small changes in their genetic diversity can have cascade effects on their associated communities. Unfortunately this effect is poorly studied in communities of the ultimate trophic level and in environments with high diversity and strong seasonality, such as tropical dry forests. We evaluated the effect of genetic diversity of one putative foundation specie, *Bursera copallifera* (Burseraceae), on the spider community in Morelos State, Mexico, in three localities were *B. copallifera* genetic diversity was obtained and their associated spiders were collected and identified to the finest possible taxonomic level. Our results shows that spider community is comprised by 40 families, 114 genera and 177 species, being the family Theridiidae the richest one, with 33 species, but the family Araneidae dominant in terms of abundance with 564 individuals (N=3,762). We found a strong effect of both, seasonality and *B. copallifera* genetic diversity, over spider richness and abundance, suggesting that these are the main factors affecting the structure of spider community and that *B. copallifera* may be acting like a foundation specie in this system.

A REVISION OF *EPICERATICELUS* (ARANEAE: LINYPHIIDAE)

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The spider genus *Epiceraticelus* (Araneae: Linyphiidae) was originally described by Crosby and Bishop in 1931 with only one species: *E. fluvialis*. With the discovery of a second species with similar male and female genitalia and somatic morphology, we expanded *Epiceraticelus* to include two species. The new species, *E. mandyhowei*, was discovered in the 1990s and is named in honor of the late arachnologist, Mandy Howe. Ranging from the coast of Virginia to South Carolina and west to Louisiana, *E. mandyhowei* is winter-mature and has been collected from October – April. The two species are likely allopatric and have never been collected together. The male of *E. mandyhowei* possesses a modified carapace with a long horn just dorsal of the AME which is likely used during mating. Additionally, pores have been found on the carapace horn which possibly function to produce a substance on which the female may feed during mating.

A MULTI-TAXON CYBERDIVERSITY INVENTORY OF A SMALL CARIBBEAN ISLAND

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In October 2015, a team of researchers and students conducted a rapid inventory of Sint Eustatius, a 21 km2 island in the Lesser Antilles. A sampling protocol targeted vascular and non-vascular plants, lichen, vertebrates, gastropods, butterflies, and selected megadiverse arthropods (spiders, ants, beetles, and true bugs) across a gradient of habitats and anthropogenic impacts. For megadiverse groups, not all species were determined using formal scientific names. Nevertheless, all were assigned persistent identifiers linked to digital image libraries and DNA sequences as prescribed by the cyberdiversity approach. We contrast the cyberdiversity approach with a recent broad spectrum taxonomic inventory of the Caribbean island of Montserrat. The Montserrat inventory targeted plants, vertebrates, and arthropods with emphasis on beetles. Montserrat exemplifies the asymmetries that make the challenge of building knowledge about megadiverse groups different from inventories of groups like plants and vertebrates, a problem referred to as the taxonomic impediment. Of the 718 beetle species sampled, only a few can be confidently associated with a valid scientific name due to deficiencies in the literature and limited comparative work across Caribbean islands. Unfortunately, the situation following the Montserrat inventory is only marginally better. A partial list of beetle names was produced and specimens were vouchered in an accessible research collection. But determining which beetle species present on Montserrat might be shared with samples from other islands remains a daunting challenge. By using the cyberdiversity approach, we make it much more likely that independent researchers will be able to reconcile their collections with ours.

CONTRIBUTION TO THE KNOWLEDGE OF OGRE-FACED SPIDERS (ARANEAE: DEINOPIDAE) FROM COLOMBIA

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Ogre-faced spiders of the family Deinopidae (Araneae: Deinopoidea) are recognized by their both unusual behaviour of build their webs suspended between their front legs and their extremely developed posterior median eyes. Currently, this particular group of spiders has two genera, one of these is *Menneus* Simon, 1876 with 14 species of Old-World distribution, and the other one is the cosmopolitan *Deinopis* MacLeay, 1839 with 47 species, 21 of which are from the New World. Nonetheless, in spite of this particularities that could make them an interesting group to research, their diversity and distribution in the New World remain highly unknown. In Colombia, that situation is not different, with only two species known from the country, both of them described by C.L. Koch and E. Keyserling more than one hundred and thirty years ago. In this sense, the main objective of the project was start to unveil the diversity and distribution of deinopids from Colombia, through examination of specimens deposited in the Arachnological collection of the Instituto de Ciencias Naturales of the Universidad Nacional de Colombia, and the Entomological collection of the Pontificia Universidad Javeriana. 33 specimens in three morphospecies were examined, two of which were determined as part of the very wide-distributed *D. spinosa* Marx, 1889 and *D. longipes* F.O. Pickard-Cambridge, 1902. On the other hand, the third one species found apparently correspond to an undescribed species. Finally, distributional and faunistics notes about ogre-faced spiders from Colombia are given.

PHYLOGENETIC ANALYSIS OF A NEW LINEAGE OF JUMPING SPIDERS (SALTICIDAE: SALTICINAE: AMYCOIDA) FROM COLOMBIAN ANDES

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Jumping spiders are the most diverse family within Araneae. Currently there are 60 species in 41 genera recorded from Colombia, but given the geographical position and the complex-topography of the country, the diversity could be underestimated. Colombia also has an extensive area of equatorial Andean region, which is one of the most interesting biogeographic places to find new lineages in this family. This project analyses the phylogenetic relationships of a new linage included in the Amycoida clade, and possibly related to the Amycini tribe (Salticinae). This group is currently recorded in eight locations throughout high areas of the Eastern mountain range. A phylogenetic analysis based on genes COI and 28S, along with an analysis of important morphological characters in the taxonomy of the group were performed to clarify the relationships of this new lineage inside the Amycoida clade. At the moment, the morphological evidence supports this lineage as a new genus within the tribe Amycini. Additionally, more exhaustive phylogenetic analyses will be performed to clarify how many species are in this lineage and their inter-relationships to explain the high-morphological variation found in sexual characters between specimens of different locations.

BEHAVIORAL USE AND PHYSICAL CHARACTERISTICS OF DEFENSIVE SILK IN THE WESTERN BLACK WIDOW SPIDER (*LATRODECTUS HESPERUS*)

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Behaviors associated with defense against predation are under high selective pressure. Because of this, judicious use of defensive behaviors associated with a high, or potentially high, metabolic cost should be favored. Animals that exhibit behaviors that are both defensive and have high metabolic cost offer an excellent opportunity to study an animal's ability to make decisions and possible cognitive capabilities. Spiders in the genus *Latrodectus* are unique in their active use of silk during defense. This silk has several unique physical attributes including the presence of very large viscous globules, which are potentially metabolically costly to produce and are structurally distinct from gum-footed lines. In this study, we investigated the ability of *L. hesperus* to control the quantity of silk and the volume of viscous globules used during defensive events and its physical appearance. We use a repeated measures design and tested each spider under three threat conditions: low (prods to legs IV) and medium (pinch and hold of leg IV) and high (pinch abdomen). We found that spiders were significantly more quick to engaged in the behavior and had larger viscous globules in the medium threat condition. Additionally, defensive silk was structurally distinct from gum-footed lines. These results suggest that the defensive use of silk is metabolically costly and is possibly under cognitive control.

A PHYLOGENETIC ANALYSIS OF THE GENUS *ERIGONE* AUDOUIN, 1826 (ARANEAE, LINYPHIIDAE)

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The Cosmopolitan genus *Erigone* Audouin, 1826 currently contains 110 species, with 39 species included in the Nearctic fauna. The last revision of the Nearctic species was done by Crosby and Bishop (1928), and many species have since been added, while many others have been transferred to other genera. Because no revision of the entire genus has ever been done, the genus is in need of revision. Many of the species are found only in the Nearctic, leading us to ask whether these species form a monophyletic clade within the genus. To answer this question, we obtained 72 specimens of 16 species within the genus *Erigone* from the Nearctic as well as other countries outside the Nearctic (e.g., Ireland, Czech Republic, Japan, Germany). For this preliminary investigation, we used the DNA barcoding gene cytochrome *c* oxidase subunit I (COI) to construct a phylogenetic tree. This initial tree did not show any distinct geographic patterns. Some of the species included have Holarctic or Cosmopolitan distributions (e.g., *E. cristatopalpus*, *E. atra*, *E. aletris*), potentially confounding the interpretation of the analysis for our question when we had so few species. Additional sampling and species are required to better resolve this question.

THE INFLUENCE OF ABIOTIC AND BIOTIC FACTORS ON THE WEB CONSTRUCTION BEHAVIOUR OF *ARGIOPE*

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There has been much interest in how orb-weaving spiders alter their web design in response to environmental changes and how this differs between species. The addition of stabilimenta, as seen in the webs of *Argiope*, is UV reflective and is thought to attract insects and increase foraging success (UV reflectance theory). However, other studies have produced a contradicting hypothesis postulating that stabilimenta deter larger vertebrates to avoid web damage (signalling theory). We aim to investigate how changing abiotic and biotic conditions alter web building, including stabilimenta use, for two species of *Argiope* from different biomes, a topic which has been understudied. Individual *A. bruennichi* have been collected and are being studied in captivity to explore web building responses to varying light intensity, humidity, temperature, prey size and prey abundance. We will collect *Argiope argentata* from Mexico to allow comparison to *A. bruennichi*. The project will allow us to investigate differences in general orb web geometry and expected correlations to absolute and abiotic indicators of prey abundance. Furthermore, differences between stabilimenta presence and size between the two species and their response to the applied conditions will probe our hypothesis that the UV reflectance theory and signalling theory may both be applicable depending on the necessity of these functions in regards to a species' habitat and ecology. We'll discuss preliminary results within the context of the stabilimenta function debate for these fascinating spiders.

CIBERDIVERSITY OF PSEUDOSCORPIONS (ARACHNIDA, PSEUDOSCORPIONES) IN A TROPICAL RAINFOREST OF THE RESERVA DE LA BIOSFERA LOS TUXTLAS, VERACRUZ, MEXICO

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A faunistic inventory was carried out to know the diversity of pseudoscorpions in the Reserva de la Biosfera Los Tuxtlas. This inventory consisted of two expeditions throughout one year, applying standardized collection methods in one hectare of tropical rainforest. A total of 443 organisms were collected, 174 juveniles and 269 adults. Ten species belonging to five families were found, being Chernetidae the most diverse with five species, and Chthoniidae the most abundant with 217 specimens. In this study a new genus and two new species were discovered. Also, a new genus is recorded for the country and a new family is registered for the state of Veracruz. These species were documented with 77 standardized digital photographs and 28 scientific illustrations, available at www.unamfcaracnolab.com. Fifteen sequences of a fragment of the Cytochrome Oxidase I gene (COI) were obtained to test the correspondence of< genders. In addition, an analysis of species richness was performed, which indicated that 91% to 100% of the total species were collected in one hectare of leaf litter. The seasonality analysis showed that there is no significant difference between the two expeditions. Finally, the diagnosis of each species was elaborated, as well as a dichotomous identification key.

THE ORIGINS OF THE PSECHRIDAE: WEB-BUILDING LYCOSOID SPIDERS

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Psechrids are the most fascinating and enigmatic spiders in the world. This small family builds sheet webs and even orb webs, yet unlike other orb weavers, its putative relatives are cursorial lycosoid spiders. By implication, the orb web was invented at least twice: first in a very ancient event, and then second, in this remarkable case of wolf-like spiders reinventing the art of orb-weaving. Exactly how the spiders modified their silks, anatomy, and behaviors to accomplish this transition requires that we know their evolutionary origins -- yet, thus far, molecular phylogenies show poor support and considerable disagreement. Using phylogenomic methods based on whole body transcriptomes for psechrids and their putative relatives, we have recovered a well-supported phylogeny to answer the question of their origins.

BIOCHEMICAL ADAPTATIONS OF OVERWINTERING SPIDERS

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Global climate change is having major impacts on the temperate winter season. Winter warming is causing not only increases in average temperatures, but also an increased frequency of freeze-thaw cycles and extreme precipitation events. Most arthropods overwinter in a dormant state, and successful overwintering requires enhanced energy storage, reduced energy usage, or both. However, about 15% of spider species remain active during the winter season. Winter-active spiders possibly show a departure from usual overwintering energetic constraints, as continued foraging may allow spiders to maintain energy reserves over winter. Winter activity could provide spiders a competitive advantage by giving a jump-start on reproduction in the spring, thus providing a fitness advantage to spiders capable of accumulating energy in the winter. This study investigated the metabolic adaptations of overwintering wolf spiders, *Schizocosa spp.* These spiders are common to eastern U.S. forests, and play major roles in biological control of forest pests and in ecological processes such as nutrient cycling and decomposition. Spiders were collected October 2016 to March 2017, and energy reserves measured. This research is part of a bigger study examining both energy and nutrient-usage by spiders, as well as accumulation of cryoprotectant agents that allow spiders to avoid freezing during the winter. Our overarching goal is to understand how winter warming will impact spiders' winter survival, their contribution to year-long biological control through winter predation, and their continued role in vital ecological processes.

COSMETIDAE MISFITS: THE DISTINCT GENITALIC MORPHOLOGY OF *ERGINULUS* (OPILIONES: LANIATORES: GONYLEPTOIDEA)

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With more than 700 described species, the family Cosmetidae represents one of the most diverse families of harvestmen, yet it remains one the most poorly studied in terms of modern systematics. Cosmetids reach their peak diversity in tropical regions of northern South America and Mesoamerica where they often make up more than half of the harvestmen diversity. Despite the lack of phylogenetic studies for the family, the monophyly of Cosmetidae, supported by several strong synapomorphies, is undisputed. Most genera, however, are poorly defined and regarded as non-monophyletic, and thus require major systematic revisions. Taxonomic work, including generic revisions and new species descriptions, has been impeded by the lack of details related to genitalic morphology for most species – important characters on which modern harvestmen systematics relies. In this study, we examine the unique genitalic morphology exhibited by two species of *Erginulus* and compare their morphology to that of the common cosmetid form in the context of a recently developed classification system for the genitalic macrosetae. We discuss why this genus is a favorable place to begin revisionary systematics within Cosmetidae. Finally, based on a small taxonomic sampling, we present the first insights into the phylogenetic relationships within Cosmetidae and illustrate the future directions for this work.

CONTRIBUTIONS TO THE MEXICAN SPECIES OF THE SPIDER GENUS *ISHANIA* CHAMBERLIN, 1925 (ARANEAE, ZODARIIDAE)

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A taxonomic revision was carried out with the Zodariidae material collected from three sites: “Las Pozas” a tropical forest fragment used for ecotourism in San Luis Potosí State, and two oak forest fragments, “Atotonilco and Xamaticpac”, approximately 15 kms away from Pico de Orizaba National Park, both in Veracruz State. A total of 350 specimens (200 females, and 150 males) were sorted to five described species with the following contributions to the Mexican fauna. One new species for the genus Ishania represented by both sexes, the description of the male of Ishania querci and the synonymy of I. simplex and I. xilitla based on an analysis using a fragment of the cytochrome oxidase I All of these species were documented with high resolution digital images available at www.unamfcaracnolab.com. Specimen collecting and imaging protocols applied the tools provided by the Cyberdiversity initiative to maximize the distribution and comparisons of these biodiversity data.

DIINTEGRATIVE SPECIES DELIMITATION IN THE THORN HARVESTMEN *ACUCALVELLA* (OPILIONES, ISCHYROPSALIDOIDEA)

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The species concept controversy has in-part been the result of workers on one group of organisms applying species delimitation criteria that are poorly suited to other groups that may diversify in inherently different ways. Here we integrate morphological and phylogenomic data to delimit species in the Thorn Harvestmen *Acuclavella* (Dyspnoi, Ischyropsalidoidea) from the Western Hemlock Zone of the Pacific Northwest of the United States. We test diversification hypotheses that include vicariance caused by mountain orogeny and occupying disparate Pleistocene glacial refugia, allopatric speciation across riverine barriers, and speciation driven by selection. We provide evidence that all of these factors are or may be playing a role in the diversification of *Acuclavella* species. We formally test alternate hypotheses regarding the number of *Acuclavella* species using coalescent-based species delimitation. We uncover evidence that multiple *Acuclavella* lineages appear to be in the early stages of speciation. Most of these diversification events appear to be caused by allopatric isolation and vicariance. However, selection too may be playing a role in one lineage, as evidenced by an apparently local adaptation persisting in the face of gene flow from a neighboring species. By applying a single delimitation criterion to assign species-level names across lineages diversifying in different ways, we run the risk of obscuring insight into the diversification process in *Acuclavella*. This research identifies a system that may be useful in the study of early speciation.

OLD PAPERS, NEW DATA: APPLICATION OF DOCUMENT MARK-UP TO LIOCRANID SPIDERS (LIOCRANIDAE ARANEAE)

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Publication of newly discovered taxa and results of biological inventories have commonly been the main goals of taxonomy and biodiversity. Although these publications are crucial for the interchange and growth of our biodiversity knowledge, they are not the end itself for this kind of data. In past years, the New Taxonomy and Cyberdiversity approaches have been proposed as a way to share, improve and accelerate the production of new taxonomic and biodiversity data (molecular, geographical and morphological information on specialized websites), and also as a way to re-explore, evaluate and analyze the old information contained in biological collections, and previously published taxonomic legacy papers. The re-analysis of information from old taxonomic papers has received little attention in part because of the difficult access to old literature, complications on data extraction and lack of a unified structure for analyses. Initiatives like BHL and Open Access have made available worldwide both old and newly published taxonomic papers in PDF format and several XML markup schemes have been used to extract taxonomic information in a semi-automated way. We used the program Golden Gate Imagine to markup all the taxonomic data on liocranid spiders published in the last twenty years according to the World Spider Catalog. This information was compiled and analyzed in Plazi website creating a standardized dashboard that contains charts, graphs and maps allowing us to observe and understand general taxonomic data and discover patterns that are otherwise not easily detected. Advantages, disadvantages and scope of this approach will be discussed.

NEW, SENSITIVE BEHAVIORAL ASSAY SHOWS THAT SCORPIONS RESPOND TO UV, GREEN, AND RED LIGHT

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Scorpions fluoresce a bright green when under ultraviolet light, but the functional significance of the fluorescence is still unknown. A major challenge in studying scorpion fluorescence is the lack of efficient methods for testing the behavioral photosensitivity of scorpions. We have modified previous assays to produce a more sensitive, behaviorally-relevant apparatus. The apparatus consists of a circular track made of a small Petri dish nested inside a larger one, with an LED shining from the middle of the chamber across a small sector of the track. We tracked the scorpions' movements in the arenas under three light wavelengths: ultraviolet, green, and red. All wavelengths were matched to a nighttime light intensity (0.01 irradians); we also tested each animal under no light for a control. The animals responded strongly and similarly to green and ultraviolet light; they also showed a minor response to red. The scorpions in this assay were attracted to the light, which is at odds with their normal phototactic behavior. Previous anatomical studies suggest that scorpion photoreceptors form a homogeneous population. We hypothesize that the photoreceptor population, which physiologically has been shown to be maximally sensitive to green wavelengths, might be slightly responsive to red light too. The strong response to UV light, as has been seen in other behavioral assays, remains enigmatic. Taken together, we think this new assay is more sensitive than previous assays for detecting scorpion photoresponse and will be useful for future sensory-ablation studies.

INSECT DETECTION OF FLOWER-DWELLING CRAB SPIDERS

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Flower dwelling crab spiders (Araneae: Thomisidae) use camouflage to be undetected by predators and prey. However, some insects can detect spiders indirectly through the smell and presence of spider web, and directly, by seeing spider color and morphology. Spider camouflage, therefore, is a critical modulator in predator-prey interactions. In this project, we aimed to determine the characteristics (morphology and color) of color polymorphic *Mecaphesa dubia* spiders that occupy *Palafoxia lindenii* flowers from the perspective of insect visitors. We placed spider models (form detection) and tethered live spiders (color detection) on flowers quantified the frequency of insect visitors. Using digital photography and visual modelling, we determined whether bees are able to differentiate colors of spiders according to contrast with the flowers. Our results show that bees, wasps and flies differentiate the form of spiders, but spiders of different colors are perceived only by bees and wasps. Spiders can be detected in the flowers by characteristics like legs and color when there is high contrast between the morph and the flower. The contrast in UV light that spiders have on flowers is ecologically relevant, because it is involved in pollination and even is attractive to insects. Further studies will focus on the effect of spider location on detection and trajectory analysis of the visiting insects.

ROUTINE METABOLIC RATE AND ITS RELEVANCE FOR PERFORMANCE TRAITS IN THE SALT MARSH WOLF SPIDER *PARDOSA LITTORALIS*

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Metabolic rate (MR) has been proposed to play a central role in ecology, ranging from individuals to ecosystem level processes. However, there is currently considerable debate, not only over whether MR can be seen as a "pacemaker" for processes within individuals and beyond at higher levels of ecological organization, but even regarding its scaling with body mass in individuals. Here we test whether routine MR (estimated over a 2h period at constant temperature) is a repeatable phenotypic trait over the adult lifespan and examine the scaling relationship with body mass in *Pardosa littoralis*. Further, we test whether MR can predict repeatable locomotor performance traits. We find that routine MR decreases with adult age, that the scatter around the allometric regression slopes prevents firm conclusions about the values of the slopes (we estimated MR twice for each individual), but that MR is indeed a phenotypic trait with significant repeatability. However, the importance of MR for performance traits such as top and cruising speeds, as well as endurance appears limited in this species.

WING INTERFERENCE COLORATION AS AN ANTI-PREDATOR STRATEGY: A CASE STUDY WITH JUMPING SPIDERS

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Visual signals in predator-prey interactions are highly variable, with combinations of bright coloration and movement. In the salticid-tephritid system, spiders are deterred by the supination (wing display) behavior of the flies and this has been attributed to a combination of wing movement and pigmentation. In many dipteran flies, the wings also show coloration in the form of wing interference patterns (WIPs), which may be enhanced during anti-predator displays. In this study, we evaluated the efficacy of the supination behavior of the fruit fly Anastrepha ludens (Diptera: Tephritidae) towards the jumping spider Phidippus audax (Araneae: Salticidae) under different light conditions. We presented the spiders with four different visual treatments of the flies' wings, with the natural pigmentation of the wings as control, and variations of brightness and wing interference patterns as experimental treatments. Video recordings of the interactions between the spiders and the flies showed that the presence of WIPs has a negative effect on the probability and efficiency of an attack by the spider. Our results suggest that the presence of WIPs can be beneficial to prey who are delivering visual signals. Interference colors could have an important function in predator-prey interactions when visual signals are involved, and further studies will focus on visual modelling from the perspective of jumping spider vision.

NOTES ON THE LIFE HISTORY OF A MEXICAN SCORPION WITH SEXUAL STINGING BEHAVIOR DURING COURTSHIP

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Megacormus gertschi Diaz Najera 1966 (Scorpiones: Euscorpiidae: Megacormiinae) is a Mexican scorpion inhabiting pine-oak forests of Hidalgo, whose males perform sexual sting during courtship. The aim of this study is the life cycle characterization. Field trips where done in three localities collecting individuals of different stages, including adult gravid females. Specimens were kept in captivity at Coleccion Nacional de Aracnidos (CNAN, Instituto de Biologia, UNAM), in *ad hoc* containers and periodic feeding on crickets.On one hand, in order to quantify fecundity of the species the offspring were allowed to stay with the mother until their first molt and leave her, then they were separated, counted and labelled. This component is reported as the number of offspring per litter per locality. On the other hand, morphometric records were done by measuring several body structures with millimeter slide under stereoscopic microscope. Adult measures were considered to establish the average size in males and females, as well as growth rate by measuring exuviae from sequential instars.

SEVEN NEW SPECIES OF THE GENUS *CHRYSOMETA* (ARANEAE: TETRAGNATHIDAE) FROM TWO OAK FORESTS NEAR PICO DE ORIZABA NATIONAL PARK, MEXICO

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Seven new species of the genus *Chrysometa* Simon 1895 are described: *C. citlaltepetl* sp. n., *C. triangulum* sp. n., *C. sagicuta* sp. n., *C. rosarium* sp. n., *C. atotonilco* sp. n., *C. trilobata* sp. n. and *C. xamaticpac* sp. n. Species identities were evaluated and sexes for each species matched with a fragment of the cytochrome c oxidase subunit I. These data were analyzed with maximum likelihood and the resulting cladograms separated all species with high support values (95 – 100) and an average distance of 0.093 %. The genetic signal also agreed with the diagnostic morphological features used to separate these taxa. The sex matching results discovered that the male of C. chipinque Levi 1986 actually belongs to *C. trilobata* sp. n. and the correct male of *C. chipinque* is described for the first time. All species were collected as part of a faunistic inventory from two oak forests near Pico de Orizaba Volcano National Park. A total of 399 adults specimens, 209 females and 195 males were sorted and identified. Most individuals were collected on medium vegetation with beating trays and high vegetation by direct collecting at night. High resolutions images for all species are available at www.unamfcaracnolab.com. Finally the epigynum functional anatomy for the species described here is discussed.

DIVERSITY OF SPIDERS (ARACHNIDA: ARANEAE) OF THE SINCOQUE HILL, HUEHUETOCA, ESTADO DE MEXICO, MEXICO

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In the Estado de Mexico have been reported 208 species of spiders are grouped in 42 families and 153 genera. The Sincoque Hill is found at municipality of Huehuetoca, which is located in the Northwest part of the Valley of Mexico. The present vegetation is xerophytic scrub. Collected was performed monthly from November-2015 to November-2016. Were captured using pit fall traps, direct collection and whit the net of striking. We found 439 organisms were captured belonging to 18 families and 37 morfospecies classified in 5 guilds. The most abundant families were Theridiidae (130), Araneidae (72) and Salticidae (57). The species accumulation curve was constructed with 7 nonparametric estimators of richness. The richness estimators varied among themselves but none showed asymptotic behavior. The average Shannon-Weaver index (H ') was 1.817. The genus *Scotophaeus* sp. (GNAPHOSIDAE) is recorded in this study for the first time for the Estado de Mexico. Although the study area represents an site that is relatively small and is subject to strong anthropogenic pressure, it hosts a representation of the spider fauna. This is the first araneofaunistic study in this municipality of the Estado de Mexico. Therefore, it contributes to the knowledge of the diversity of spiders of the entity.

SENSORY DISCRIMINATION AND REFUGE RECOGNITION IN AMBLYPYGIDS

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Displacement experiments with amblypygids revealed they are extraordinary navigators and their abilities are severely impeded when access to olfactory information is experimentally abolished. These results and the fact amblypygids possess sizeable mushroom bodies, brain regions that process olfactory and, perhaps, spatial information led to the hypothesis olfaction facilitates navigation. *Phrynus marginemaculatus* wanders nightly and shows strong shelter fidelity in laboratory arenas. Training was 26 nights in a square arena containing two shelters to determine the extent odor dictates shelter recognition. The target shelter was positioned near a geraniol-filled well. The other shelter was positioned oppositely near a water-filled well. Sessions consisted of nights where the target shelter entrance was open and the other shelter entrance blocked, called forced choice trials, and nights where both shelters were open, called probe trials. Probes manipulated shelter locations and associated wells after a subject emerged from the target shelter. There were three manipulation types: control manipulations in which the shelters and wells were removed and replaced with identical shelters and wells in their original locations; manipulations swapping well positions; and manipulations where both shelters and their wells were rotated 90 degrees. The odor-cued shelter was chosen in 90%+ of control probes. The other two probes choices were random, not dictated by odor. Subjects didn't rely primarily on path integration as they didn't choose the shelter in the original location of the odor-cued shelter in probes where only wells were swapped. The results suggest amblypygids may use cue configuration in shelter relocation and identification.

AGGRESSIVENESS LEVELS ARE NOT CONSISTENT ACROSS DIFFERENT STARVATION REGIMES IN A NEOTROPICAL WHIP SPIDER

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In the past decades many studies have shown that animal personality is widespread in a number of zoological groups. The most studied behavioral traits in these studies include activity, exploration, boldness, sociality and aggressiveness The state-dependent theory suggests that animal personality traits would be influenced by fixed states (such as size and morphology) and labile states (e.g. energy reserves and hunger levels). Here, we investigated if the individual aggressiveness of the Neotropical whip spider *Charinus asturius* is influenced by labile states (short and long term starvation), when interacting with unique and multiple prey, i,e. two different approaches to access the aggressiveness levels of the individuals. We also tested if the aggressiveness rank is consistent across labile states, that is, if bolder individuals continue being bolder independently of the labile state. We accessed aggressiveness in single prey tests with the latency to attack prey and latency to attack prey after a behavioral evidence of detecting prey (based upon a flowchart that we produced). In multiple prey tests, we measured the aggressiveness as the number of prey caught in a fix period of time. Surprisingly, we found no individual consistency in aggressiveness between different labile states both in single and multiple prey tests. We encourage new studies using whip spiders as experimental models to find out if this lack of consistency is also found when analyzing other behavioral traits, species and different experimental setups. This study was funded by Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) Processo: 2014/19191-3

SEXUAL DIFFERENCES IN DEFENSIVE BEHAVIOR IN A NEOTROPICAL HARVESTMAN

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Both natural and sexual selection are known to shape the morphology of animals. In sexually dimorphic animals, different morphologies may be associated with advantages and constraints. Thus, different sexes can exhibit differences in behavior (e.g. anti-predatory interactions). Among harvestmen, males in the family Gonyleptidae (suborder Laniatores) may have sharp spines on legs IV while females do not. These spines are used in pinching when these harvestmen are disturbed. Thus, we hypothesized that males would rely more on mechanical defenses (i.e. pinching with legs IV) while females would rely on other defenses. We tested this hypothesis by holding individual harvestmen *Mischonyx cuspidatus* at a distance from the substrate and releasing them. This procedure induced thanatosis (feigning death). In a second experiment we held the harvestmen dorso-ventrally by the abdomen. This procedure induces harvestmen to pinch with legs IV. We have found that i) Females engaged in thanatosis behavior more often than males ii) Males performed pinching with legs IV more frequently than females. Thus, our study hypotheses were corroborated. These sexual differences can be adaptive, since for females nipping could be ineffective considering the lack of spines that is known to threat and injure predators. On the other hand, for males, engaging in a behavior such as thanatosis may be disadvantageous. In the typical thanatosis posture, harvestman have their legs flexed, impairing the nipping movement. This study provides putative evidence that sexual differences in anti-predatory behavior may be selected at least partially as a result of morphological differences between the sexes.

THE ROLE OF VISION AND OLFACTION IN THE FORAGING BEHAVIOR OF *P. PSEUDOPARVULUS* (AMBLYPYGI: PHRYNIDAE)

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Amblypygids have multiple sensory receptors and one of the largest processing centers for sensory information among arthropods. However, the role of distinct sensory information in prey identification and capture has not yet been studied in detail. Considering these facts, we proposed to test the role of olfaction and vision in the foraging and prey capture behaviour of *Phrynus pseudoparvulus*. In an artificial arena in the laboratory, we recorded and compared prey capture behaviour and foraging success of two groups of individuals -sensory ablated and sensory control- for each sensory modality of focus (i.e. olfaction and vision). We found that the control individuals for the olfaction group had a significant success in capturing their prey ($p=0.04$), however, there was no difference in their prey capture success between control and treatment in any sensory modality, nor between sensory modalities. These results support previous evidence regarding the importance of olfaction in amblypygids and extend this sensory reliance to additional behavioral context - foraging.

MOLECULAR ANALYSIS OF GROUND SPIDERS (GNAPHOSIDAE) OF ASIA AND AUSTRALIA.

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Gnaphosidae is one of the largest families of spiders currently placed sixth in the number of described species from all Araneae. The molecular data available is extremely limited for the described species, with only 46 out of 125 genera having any molecular data (212 species from 2,195 of known species, or roughly 9.7%) (BOLD SYSTEM, 2017). Due to unequal geographical distribution of Gnaphosidae, most described species are from Holarctic region, with only minor amounts of species (only 8) being described from Australasian region (Australia, New Zealand). Presented here are preliminary results on the DNA analysis of several genes used for barcoding of Araneae (18S, 28S, co1, wnt, H3) from six genera collected in Australia, New Zealand and Asia. Two close genera, with species *Zelanda erebus* (L. Koch, 1873), *Zelanda* sp., *Zelanda* sp. 1, *Zelanda* sp. 6 and *Encoptarthria echemophthalma* (Simon, 1908) were analyzed and their taxonomical position is discussed. Additionally, two species from Eurasian genus *Haplodrassus* (*H. signifer* (C. L. Koch, 1839) and *H. hiemalis* (Emerton, 1909)) were analyzed for the genes missing from the NCBI Database, such as 18S, 28S, wnt, and H3.

COMPARING SPIDER (ARANEAE) DIVERSITY IN REMNANT VS RESTORED TALLGRASS PRAIRIE IN EASTERN SOUTH DAKOTA

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Anthropogenic influences on habitats has led to habitat destruction and species declines. The success of efforts to restore lost habitat has often been difficult to evaluate because of lost species, though groups of species (e.g., ants, spiders) have been used as bioindicators to gauge restoration success. Here we compare spider (Araneae) assemblages in remnant vs. restored tallgrass prairie in eastern South Dakota. Spiders were collected from June through August during 2012 and 2013, and each year from nine restored sites, ranging from 1 to 4 yrs after planting, and three remnant sites. Using single-factor ANOVA, we compared species richness of the varying-aged restoration sites with the remnant sites. For 2012, we found no significance between the restored sites and the remnant sites of any age. For 2013, we did find significance between the restoration sites and the remnant sites: 2 yr restored sites $P = 0.004$ ($F_{1, 38} = 9.366$), 3 yr restored sites $P = 0.023$ ($F_{1,40} = 5.574$), and 4 yr restored sites $P = 0.005$ ($F_{1,34} = 8.631$). Thus, during the second year of our study we detected significant differences in species richness when comparing remnant vs. restored sites. These results indicate that that there is significant flux in the spider community soon after restoration, and longer-term studies are needed to assess restoration success.

FIRST RECORD OF PSEUDOSCORPIONS (PSEUDOSCORPIONES: CHERNETIDAE) ASSOCIATED WITH *DENDROCTONUS* (COLEOPTERA: CURCULIONIDAE) IN OAXACA

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Pseudoscorpions performed the phoresy with different organism such as flies, opilionids, dragonflies, rodents and coleopterans, in the last group have been recorded on Passalidae, Cerambicidae, and Elateridae. The pseudoscorpions make two types of phoresy: a) active when the arachnids clinging to appendices, setae or fur of the host; and b) passive when pseudoscorpion there found under elytra of beetles. *Dendrochernes* has four species, one of them distributed in the Europe (*D. cyrneus*) and three species only recorded in United States (*D.* crassus, D. instabilis & *D.* morossus). These have been found under bark and phoretic on insects such as Cerambicidae and Hymenoptera in Florida, as well as stomach contests of bird in Montana. *Dendroctonus* is a coleopteran that live beneath bark of pine associated with mites, nematodes, and other organisms that share the same microhabit. one specimen of *Dendroctonus valens* was collected in a pheromone trap in Cojones Oaxaca (June 21 2015). Pseudocorpions were processed using Hoff's technique, modified following Wirth and Marston. We found two organisms belonging to genus *Dendrochernes* under elytra of *D. valens*. The interaction between both organisms probably occurred underneath the pine bark where both inhabit. This is the first record of pseudoscorpions associated with *Dendroctonus*, furthermore, this is the first time *Dendrochernes* is recoded in Mexico.

SHELTER DISCRIMINATION BY OLFACTION IN THE AMBLYPYGID *PHRYNUS MARGINEMACULATUS*

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Displacement experiments in the field reveal that nocturnal navigation by amblypygids is substantively impaired if the olfactory sensilla on the distal end of their specialized *antenniform legs* are made dysfunctional. Because olfactory sensilla are located nowhere else on amblypygids these results suggest that navigation is likely facilitated by olfactory cues. Here, we describe an experiment in which *Phrynus marginemaculatus* was trained over three days to discriminate between prospective shelters based on odor. Individuals were released repeatedly each day into the center of a brightly lighted runway with a shelter entrance located at each end. Each shelter, the interior of which was dark, was cued by a distinct odor—geraniol or 1-hexonal—and a screen blocked the entrance to one of the shelters. The end-positions of the shelters were randomized each time a subject was released into the runway, but for each subject the accessible shelter was consistently cued by the same odor. Tests were conducted on the third day and then again two weeks later, where a screen was used to block the entrance to each shelter. In all tests subjects spent significantly more time in proximity to the shelter entrance cued by the conditioned odor. The distal end of the antenniform legs of each subject was then clipped and, after a 24-hour recovery period, individuals were tested, retrained over a series of three days and retested. These tests revealed a residual capacity to discriminate between shelters based on odor and that performance after further training was not improved.

RESOLVING PHYLOGENETIC RELATIONSHIPS AMONG PALPIMANOID SPIDERS USING TARGET ENRICHMENT TECHNIQUES

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Palpimanoid spiders have evolved spectacular morphological modifications that are associated with unusual predatory behaviors, such as novel structural mechanisms that allow for high-speed, power-amplified predatory strikes, and grotesque morphologies that allow for attack-at-a-distance strategies in clades that are specialized to prey on other spiders. Extant palpimanoids for the most part are restricted to the Southern Hemisphere, although there is a documented fossil record from the Northern Hemisphere, with fossils going back to the Jurassic, and with distribution patterns in some groups related to Pangaean vicariance. To date, evolutionary relationships among palpimanoid members have been examined using morphology and Sanger sequencing of a limited set of markers, with relationships among families being unsupported and not well resolved. However, Next-Generation Sequencing (NGS) techniques may resolve these issues, specifically the technique of Target Enrichment, which makes use of short fragment sizes typical of degraded DNA. Using a probe set based on published spider transcriptomic data, and also using a probe set based on arachnid Ultra-Conserved-Elements we attempt to resolve deep relationships among palpimanoid families and genera.

A NEW SPECIES IN THE GENUS *WALCKENAERIA* BLACKWALL, 1833 (ARANEAE, LINYPHIIDAE), WITH A REDESCRIPTION OF *W. OREGONA* MILLIDGE, 1983

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The genus *Walckenaeria* Blackwall 1833 is a widespread genus that currently contains 198 species. The male and female of a new species is described for the first time, and is in the *acuminata* species group described by Millidge (1983) based on characters of the embolic division. We also re-describe and illustrate the male of *W. oregona* Millidge 1983, including the first detailed images and illustrations of the embolic division.

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