AMERICAN ARACHNOLOGY

The Newsletter of the American Arachnological Society

Number 44 **November 1991**

1992 ANNUAL MEETING

Craig Hieber will host the society's 1992 meeting St. Anselm College, Manchester, N.H. The meeting will run from 23 to 27 June.

ELECTION RESULTS

The following were selected in this spring's elections:

President-elect: James E. Carico
Secretary: Brent D. Opell
Director: Charles E. Griswold

NOTICES AND REQUESTS

Poisonous Spiders Needed

James C. Cokendolpher, 2007 29th Street, Lubbock, Texas 79411 (telephone: 806 744-0318) is preparing a color slide series on the medically important spiders of the world. Thus far, most USA species have been photographed, but many foreign species are still needed. If you have access to living material and are willing to ship it to Mr. Cokendolpher, please contact him for details.

Information and Specimens Sought

James C. Cokendolpher (see above request for address) is preparing a manuscript on the pathogens, parasites, and parasitoides of Opiliones. He is interested in obtaining any diseased or parasitized opilion from anywhere (write first on dried fungal samples, as permits will be required for importation from foreign countries). Gifts of opilions (alive or preserved) with attached parasitic mites would also be appreciated. Citations to publications which do not primarily deal with opilions but that do mention records of disease or parasites in opilions would also be appreciated.

Chamberlin Reprints

Recently I received the entire stock of Ralph V. Chamberlin's publications on Centipedes and Millipedes. Anyone desiring a set of these papers may write me and I will send what is available. W. F. Rapp, 430 Ivy Avenue, Crete, NE 68333.

IN THIS ISSUE

AMERICAN ARACHNOLOGY is the official newsletter of the American Arachnological Society and is distributed twice a year to members of the society. Items for the newsletter should be sent to the editor, Brent D. Opell, Department of Biology, Virginia Tech, Blacksburg, Virginia 24061, U.S.A. (Bitnet address: Uloborid@VTVM1. Deadline for receipt of material for the fall issue is 10 September and for the spring issue 10 March. All correspondence concerning changes of address and information on membership in the American Arachnological Society should be addressed to the Society's membership secretary, Norman I. Platnick, American Museum of Natural History, Central Park West at 79th Street, New York, NY 10024, U.S.A. Members of the Society also receive the JOURNAL OF ARACHNOLOGY, which is published three times each year.

J O A Cover Photo Wanted

Anyone wishing to submit a photo for possible use on the cover of Journal of Arachnology may do so by sending it to: Jim Berry, Department of Biological Sciences, Butler University, Indianapolis, IN 46208

Nomenclatural Notes

Applications appearing in Volume 48 (27 June 1991) of Bulletin of Zoological Nomenclature:

Case 2791: *Chelifer museorum* Leach, 1817 (currently *Cheiridium museorum*; Arachnida, Pseudoscorpionida): proposed conservation of the specific name.

Case 2759: *Goniosoma conspersum* Perty, December 1833 (currently *Mitobates conspersus*; Arachnida, Opiliones): proposed conservation of the species name.

Opinions published in Volume 48:

Opinion 1637. *Aphonopelma* Pocock, 1901 (Arachnida, Araneae): given precedence over *Rhechostica* Simon, 1892.

RESEARCH NOTE

SOME POMPILID WASPS AMPUTATE THE LEGS OF THEIR SPIDER PREY

On 22 July 1991, I observed a female pompilid wasp *Auplopus nigrellus* (Banks) chasing a female *Aysha incursa* (Chamberlin) up (about 1 meter) and down an elm tree in my backyard. The spider ran frantically, never stopping to fight. Once the wasp was able to corner it on the ground at the base of the tree, it stung and paralyzed the spider. This is not so remarkable, as all pompilids provide spiders as food for their unhatched eggs in this fashion. What appeared remarkable at the time was that the wasp amputated all the spider's legs before carrying the prey away. After consulting Foelix's "Biology of Spiders", I thought I had discovered something new. Correspondence with Dr. Howard E. Evans of Colorado State University revealed that my observations only confirmed those of previous authors, except that I had found a new prey species. Even the new prey record was not very exciting, as Aysha gracilis as well as several other species had already been reported. Dr. Evans also kindly identified my specimen and provided me with citations to some of the literature on this group of interesting wasps. At least two genera in our region amputate some or all of the spider's appendages prior to moving it to the next site. Foelix's book also does not mention that some adult pompilids feed on spider hemolymph. This information, as well as a wealth of other data, are provided in two general papers on pompilid biology: Evans, H. E. 1953. Comparative ethology and the systematics of spider wasps. Systematic Zool., 2:155-172 and Evans, H. E. and C. M. Yoshimoto, 1962. The ecology and nesting behavior of the Pompilidae (Hymenoptera) of the northeastern United States. Misc. Publ. Entomol. Soc. Amer., 3:67-119.

James C. Cokendolpher, 2007, 29th Street, Lubbock, Texas 79411

ARACHNOLOGY AT THE VIRGINIA MUSEUM OF NATURAL HISTORY

Established in 1988 as an agency under the Secretary of Conservation and Natural Resources, the Virginia Museum of Natural History may claim to be the youngest institution of its kind in the United States. Located in Martinsville, in the southwestern Piedmont region of the state, the museum is "off the beaten track" in terms of population centers, but admirably placed with respect to research opportunities. Five hours drive will take one to either the seacoast at Virginia Beach, the Cumberland Mountains on the Kentucky border, or Jon Coddington's laboratory at the USNM.

At present, seven curators represent the areas of mammalogy, herpetology, archaeology, hardrock geology, vertebrate paleontology, invertebrate paleontology, and living invertebrates. Although no geographic constraints are imposed on curatorial research, substantial emphasis is understandably placed on the "natural history" of Virginia and adjacent regions. In this context, the Department of Recent Invertebrates has undertaken an inventory of the state's fauna in selected arthropod and mollusk groups. Data on geographic and seasonal occurrence are accumulated from recent literature, museum collections, and on-going field work, and it is

hoped that baseline accounts will be published, as various taxa achieve a satisfactory level of coverage, in a series "Invertebrata Virginiana."

Departmental holdings in arachnids got off to an admirable early start with the donation of his personal spider collection by Bill Shear, who is a member of the museum's Board of Trustees. This extensive material consisted of over 900 vials of about 300 species of identified spiders, chiefly from Ohio, Pennsylvania, West Virginia, Florida, and New Mexico. In many families, the material has been used in revisions and authoritatively labeled by such specialists as Gertsch, Levi, Platnick, Ivie, Brady, Opell, and the donor himself, greatly facilitating the identification of incoming samples.

Under the constraints of funds, space, and, above all, curatorial time, collection development in all taxa is centered almost exclusively on the Virginia fauna. This means that VMNH will never have a large scorpion collection, but building adequate series of other mega-arachnids (sorry, no mites except in Berleseate residues!) still provides an adequate challenge, with nearly 800 species to be expected instate amongst spiders, opilionids, and pseudoscorpions. A long-range goal is to establish the precise Virginia distribution for all species. Present efforts entail sampling of selected sites across the state, using a combination of pitfalls, Berlese extraction, and traditional hand-picking, a program conducted in concert with the Virginia Division of Natural Heritage, the museum's sister-agency. During the past two years literally thousands of mega-arachnids have been taken, chiefly in the extreme southwestern part of the state (Virginia Beach and vicinity) and a number of new state records and range extensions are already established (Virginia has been a blank area on too many spot maps for too long). During 1991 the sampling network will be expanded into the Piedmont and Appalachian regions of Virginia. As would be expected, the "take" has tended to be very heavy in groups like Gnaphosidae, "Erigonidae", Lycosidae, Agelenidae, Phalangiidae and other ground-dwelling species, and correspondingly light in araneids and salticids, although an attempt will be made to correct this imbalance. To the extent that taxa have been recently revised, determinations are made in-house, which means that for some taxa (e.g., erigonids and lycosids) the process often stops at the family level. Obviously, there is a lot of material available for study and, since series are often very extensive, we have a liberal "retention policy" for any specialists interested in working on various taxa. Inquiries may be directed to the undersigned.

Richard L. Hoffman, Virginia Museum of Natural History, Martinsville, Virginia 24112

1991 ANNUAL MEETING

Meeting Report

by Brent Opell

The 1991 meeting of the American Arachnological Society was held from 17-22 June at the University of Mississippi ("Ole Miss"). The meeting's hosts, Gary and Pat Miller, treated 90 participants to three days of paper presentations, punctuated by glimpses of William Faulkner's small town of Oxford. The meeting began on Monday evening with a reception at the Downtown Grill on Oxford Square and resumed the following morning with the first paper presentations. In addition to 34 oral papers, seven posters were presented. Tuesday evening was set aside for video presentations and the following evening we were treated to a tour of Rowan Oak, Faulkner's country home, followed by a picnic on the grounds. The meeting ended, as it had begun, on Oxford Square with a reception at a bookstore called Square Books. Thanks to Pat and Gary for the careful planning that made this such a successful meeting.

Field Trip Report

By Charles Dondale

The verdant Tishomingo State Park in the northwestern corner of Mississippi was chosen by Gary and Pat Miller for the field trip this year. The park afforded good collecting, as it represents a hilly transitional area between the Appalachians to the north and the plains of central Mississippi to the south. Mature hardwoods predominate, with a thick litter layer and a penetrable understory. About 38 wild-eyed net swingers were on the Ole Miss bus, with

Vince and Barb Roth and James Cokendolpher following in a little red jackrabbit, and Marie Goodnight bringing up the rear in her camper.

First stop was at the park office and museum where we viewed the exhibits of local mammals, birds, fish, and snakes. Then we proceeded to the first collecting site near a pioneer cabin, where, under an enormous rock overhang Achaearaneae and Eustala webs were draped. Also, a species of Leiobunum with white knees bounced over the moist rock. Lorna Levi was able to fill a large vial with araneids, some still feebly waving their legs, from Trypoxylon cells. Running over the oak litter was a Schizocosa which Gail Stratton and Pat Miller thought belonged to the latest addition to the singing ocreata complex.

At noon we found shade beside Haynes Lake and devoured the box lunches provided by the Ole Miss Food Service, then headed across the historic Natchez Trace, which bisects the park. Collecting resumed in a wooded ravine with a quiet stream. Herb Levi found Micrathena sagittata, and Alan Cady an Azilla. G.B. Edwards took a nice Thiodina and some juvenile Phidippus to be reared back in the lab. David Bixler, a Californian Pardosa man, from whom we had not heard for some years, caught a Vejovus carolinianus under an oak log. Vince and James spotted a Ummidia from the cockpit of the jackrabbit, but while Vince was getting himself out of his seatbelt, James hopped out and made the capture.

En route back to the campus we stopped at a marine Cretaceous fossil site that had been exposed when a new bridge over Twenty Mile Creek was built near Frankstown, Prentiss County. Even the driver was out collecting sharks' teeth. Then it was back through the bean fields, past blooming mimosas, past people at work on the red soil, and past whole landscapes smothered by Japanese Kudzu vine, back to Oxford.

And so another memorable conference ends with an interesting field trip. We owe much to Gary and Pat who planned and carried out the whole day's outing without loosing so much as one arachnologist. Thanks to them, Mississippi is becoming less the blank spot on our range maps than in the past.

Student Paper Awards

First Place: David Kroeger, Department of Biological Sciences, University of Cincinnati. Paper (with G. Uetz): Aggressive interactions between males in Metepeira incrassata, a colonial orb weaving spider.

Second Place: Micky Eubanks, Department of Biology, The University of Mississippi. Paper (with G. Miller): Effects of intraspecific density and predation pressure on a habitat shift in the wolf spider Gladicosa pulchra.

ABSTRACTS

** Survivorship of Wolf Spiders (Lycosidae) Reared on Different Diets [Poster]

Jenniver Bischoff, George W. Uetz. Department of Biological Sciences, University of Cincinnati, ML 006, Cincinnati, OH 45211-0006.

Anecdotal observations from previous studies have indicated that lycosid spiders often die before maturing when raised on only one prey type. Two wolf spider species (*Schizocosa avida* collected from Kentucky, and an unknown *Lycosa* sp. collected from Florida) were used to test the hypothesis that diet affects survivorship. Siblings from one egg sac of each species were divided into two groups of 50 spiderlings each, and reared under identical conditions with different diets. The polytypic diet consisted of crickets (*Acheta domesticus*), fly grubs (*Sarcophaga bullata*), cockroaches (*Periplaneta americana*), mealworms (*Tenebrio molitor*), bettles (*Dermestes* spp.), and an occasional supplemental orthopteran collected from the field. The monotypic diet consisted only of crickets (*Acheta domesticus*). There was a significantly lower survivorship of spiders raised on monotypic prey in both species, although the pattern of mortality over time varied between species. These results support the hypothesis of Greenstone (1979) that lycosids require a mixed diet.

** Preliminary analysis of relationships between maturation date and spider weight, egg sac weight, website, and website residence duration for a field population of *Achaearanea*

tepidariorum [Poster]

Alan B. Cady. Department of Zoology, Miami University - Middletown, Middletown, OH 45052

Achaearaneae tepidariorum (Theridiidae) were studied on sandstone cliffs in East Tennessee. Individuals that matured early in the season had significantly greater body lengths and weights and egg sac weights than did those that matured later. The size of a web's main tangle was the best predictor of these three variables. Individuals that matured earlier moved less than those that matured later. When individuals were sequentially introduced onto an isolated cliff, the original residents defended and maintained their websites against the introduced spiders and withstood cold temperatures better than did the introduced individuals. It appears that early maturing individuals owe their larger size and increased reproductive output to the their larger web's enhanced ability to capture prey. Spiders able to establish websites first would have more space available to them, allowing them to construct larger webs. Because individuals that hatch early would have more time to grow before overwintering, they would also mature and reproduce earlier during the next spring. Thus, those spiders securing websites early have a greater probability of reproductive success for themselves and their offspring. There may be a genetic component to cold tolerance (which may be a function of size) or early reproduction that confers this advantage or it may simply be that "early spiders" occupy the best and largest web sites, thus perpetuating this cycle.

** R. V. Chamberlin's Spider Names

H. D. Cameron. Dept. of Classical Studies, University of Michigan, Ann Arbor, Michigan 48109

Chamberlin was fond of creating names on the rhyming principle. From *Lyc-osa*, by misdividing the morphemes, he created the name *Schizo-cosa*, so that the rhyming morph indicated that it was a Lycosid genus. Likewise, to rhyme with *Dicty-na*, again misdividing, he created such names as *Tos-yna*. Many of the more mysterious elements in his names are taken from the language of the Gosiute Indians, his neighbors in Utah, from which he created hybrid names composed of Greek, Latin, and Gosiute. Examples of such names are: *Phrurotimpus*, *Tosyna*, *Oaphantes*, *Calisoga*, and *Tidarren*. Some are completely Gosiute, such as *Kibramoa and Pimoa*.

** A Model of Foraging Strategies in *Argyrodes trigonum*. [Poster]

Karen R. Cangialosi. Dept. of Zoology, Miami University, Oxford, OH 45056

The spider species, *Argyrodes trigonum* forages in the webs of other spiders by stealing food captured by the host (kleptoparasitism), but also by preying on the host, stealing the host's web, or building its own web and foraging independently. Which foraging strategy an individual exhibits probably depends on a wide variety of conditions including availability of hosts, host webs, web sites, and prey. In order to investigate how changes in ecological conditions maintain this behavioral polymorphism, a mathematical model was developed to generate predictions of how A. trigonum foraging mode choice is influenced by these factors. Data from field observations and experiments will be interpreted in light of these predictions.

** Water and Hemolymph Content of Insects and Spiders

James E. Carrel. Division of Biological Sciences, University of Missouri-Columbia, Columbia, MO 65211

Water content of many insects and spiders, which is readily determined by subtracting dry mass from wet mass, typically represents more than 50% of an animal's live body weight. Body water content seems to be correlated more with an animal's diet than with its body size or its environment. Hemolymph volume is technically difficult to ascertain , so relatively little information about the amount of hemolymph in insects and spiders is available. In general, hemolymph represents from 25 to 40% of the live mass of these animals. In insects hemolymph contributes more than other tissues to water loss during dessication; the same phenomenon may occur in spiders. These laboratory findings suggest that, under natural conditions, hemolymph content may be more variable than water content in insects and spiders.

** Impact of Spiders on Pest Insects Damage to Soybeans. [Poster]

Paul E. Carter (1) and Ann L. Rypstra (2). (1) Department of Zoology, Miami University, Oxford, OH 45056 (2) Department of Zoology, Miami University, Hamilton, OH 45011

The goal of this project was to increase spider density in soybean fields in order to reduce insect pest damage. We encouraged spider colonization in four soybean monoculture fields by providing artificial habitats (old crates) early in the season. We monitored the spiders that colonized the shelters and the biomass of insects consumed each week from 10 July - 13 October 1990. We also monitored leaf damage both near (<1m) and far (>10m) from the shelters monthly. The number of spiders in the shelters increased over the season to a maximum in late September. Leaf damage near the shelters was negatively correlated with spider number, and consumed insect biomass was positively correlated with spider number. In August, leaf damage near the shelters was significantly less than leaf damage far from the shelters in all four fields. These results suggest that increasing spider densities can be beneficial to agricultural crops.

** Effect of Female Age on Receptivity and Mate Choice in Wolf Spiders (Schizocosa ocreata). [Poster]

Veronica M. Casebolt, Melissa Decker, Elizabeth Ponce, George W. Uetz Department of Biological Sciences, University of Cincinnati, Cincinnati, OH 45221-0006

Male wolf spiders of the species *Schizocosa ocreata* are recognized by conspicuous tufts of bristles on their first pair of legs. Earlier studies have suggested this secondary sexual characteristics may influence female mate choice. Since males reach sexual maturity well before females, early maturing females might have more potential mates, and therefore be more selective. This hypothesis was tested by presenting females of different ages with either intact or experimentally altered males (with tufts removed). Females mature for <48 hours responded positively to males less often than those mature for >3 weeks. Although females mature <48 hours showed less overall receptivity, no difference was seen in responses to shaved vs. intact males. Females mature >3 weeks exhibited a significant preference for intact male, displaying receptivity to the shaved individuals less frequently. These results suggest that female age may influence receptivity, and consequently bias mate choice studies.

** Amino Acid Composition of Dragline Silk in Phidippus

Carrie A. Cate. Department of Biology, Midwestern State University, Wichita Falls, Texas 76309

The percent amino acid composition of the silk protein in two species of salticids, *Phidippus audax* and *Phidippus apacheanus*, is determined. Comparisons are made between silk removed directly from major and minor ampullate glands and newly produced dragline silk.

** Movement-biased Mate Choice and Image Similarities as a Function of Divergent Courtship Postures in the Dimorphic Jumping Spider, *Maevia inclemens*.

David L. Clark. Department of Biological Sciences, University of Cincinnati, Cincinnati, OH 452221-006

Males of the dimorphic jumping spider, *Maevia inclemens*, are both morphologically and behaviorally distinct (i.e., initiate courtship differently). Previous studies suggest that females choose mates on the basis of which male they see move first. This hypothesis was tested using videotaped sequences of male courtship behavior, where movement was experimentally controlled. Male morphs were synchronized behaviorally (by computer digitization) and presented to female simultaneously in the Y-maze test chamber. Results confirm that females do not show a preference for either male morph. It is hypothesized that the divergent behaviors of Phase I courtship (i.e. initiation) exploit the female movement detection response from different distances (the tufted morph begins at 86 mm and the grey morph from 34 mm). A graphic model, based on the visual range of females, demonstrates that Phase I courting males are similar in apparent visual target area. Furthermore, the shape of the two male types in Phase I courtship posture may share image similarities from the perspective of observing females.

** Estimating Spider Biodiversity in the Tropics

Jonathan A. Coddington (1), Charles E. Griswold (1), Diana Silva Divia (2), Efrain

Penaranda (3), Scott F. Larcher (1). (1) Department of Entomology, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560 (2) Museo de Historia Natural de la Universidad de San Marcos, AV. ARENALES 1256, APTO. 14 0434, LIMA 14, PERU (3) Instituto de Ecologia, Casilla 10077, La Paz, Bolivia

Allocating conservation resources wisely requires, among other things, information on the geographic distribution of biodiversity. Using minimal modifications of standard museum collecting techniques, we sampled three sites in Bolivia along an elevational gradient in order to estimate total species richness (St) at each sites. Four analytical methods to estimate St are presented and discussed. We also compared the effect of different collectors, collecting techniques, and time of day on numbers of species and individuals collected per sample.

** Two New Species of *Nesticus* Spiders from the Southern Appalachians (Araneae, Nesticidae)

Frederick A. Coyle and Augustus C. McGarity. Department of Biology, Western Carolina University, Cullowhee, NC 28723

Diagnoses, descriptions, illustrations, and natural history data are presented for two new species of *Nesticus* spiders: N. n. sp. 1 from epigean habitats in southwestern North Carolina, and N. n. sp. 2 from a cave in eastern Tennessee. *Nesticus* n. sp. 1 appears to be the sister species of *Nesticus brimlevi* Gertsch, a cave-dwelling species. *Nesticus* n. sp. 1 exhibits marked geographic variation, is found only in humid and dark microhabitats, and may exhibit the prolonged reproductive activity characteristic of cave-dwelling nesticid species.

** Observations on the Behavior of the Kleptoparasitic Spider, *Mysmenopsis furtiva* (Araneae, Mysmenidae)

Frederick A. Coyle, Theresa C. O'Shields, and Daniel G. Perlmutter. Department of Biology, Western Carolina University, Cullowhee, NC 28723

Mysmenopsis furtiva, a tiny spider which lives in the funnelwebs of the Jamaican diplurid spider, *Ischnothele xera*, behaves both as a kleptoparasite and as a commensal; it pilfers portions of its host's prey and also captures and consumes minute insects which are trapped in the host web and unnoticed or ignored by the host. *Mysmenopsis furtiva* is able to ingest hemolymph from its host's prey at a much faster rate than it can ingest material from the insects it captures. Two of its stealth strategies are to move not at all or slowly when the host is motionless and to synchronize its rapid movements with host movements. The host's anti-kleptoparasite behaviors suggest that the kleptoparasite has a significant negative impact on the host.

** Retreat Architecture and Construction Behavior of an East African Idiopine Trapdoor Spider (Araneae, Idiopidae)

Frederick A. Coyle and Robert E. Dellinger. Department of Biology, Western Carolina University, Cullowhee, NC 28723

The arboreal retreats of an East African idiopine spider are provided with a trapdoor with tabs on its edge. The trapdoor is constructed by virtually the same door-molding behavior program observed so far in the citenizids (*Ummidia* and *Hebestatis*) and antrodiaetids (*Aliatypus*), a construction program very different from the door-cutting behavior of another idiopid trapdoor spider, *Arbanitis gillesi*. Present evidence indicates that, in the idiopidae, the door-molding program is primitive and door-cutting is derived. It is suggested that the door edge tabs may increase the spider's prey-sensing radius and allow the door to be closed more securely. Observations of door closing, prey capture, and soil ejection behaviors are presented.

** DNA Sequences Reveal Three Major Clades of Hawaiian Spiders in the Genus *Tetragnatha*. [Poster]

Henrietta B. Croom (1), Rosemary G. Gillespie (2). (1) Department of Biology, The University of the South, Sewanee, Tennessee 37375 (2) Department of Zoology, University of Hawaii-Manoa, Honolulu, Hawaii 96822

Mitochondrial DNA coding for most of the third domain of the RNA of the ribosomal small subunit has been sequenced form 40 individual spiders of 11 different endemic Hawaiian morphospecies and one circumtropical (presumably-introduced) species *T. mandibulata*. The secondary structure of the rRNA encoded by these sequences has been determined using the folded sequences from primates and insects as a

guide. The spider rRNA shows strong similarity in secondary structure to these other taxa. Preliminary calculation of sequence differences across all sites shows that each endemic spider is approximately 21% different from *T. mandibulata.* Endemics differ from each other by 3-13%. This suggests that the endemic spiders studied so far may be derived from a single introduction to the Hawaiian Islands, corroborating a similar conclusion based on morphology. The sequences from 20 spiders over a 204-base-pair homologous region were compared and variations were found at 44 different sites. These variable sites were analyzed using *T. mandibulata* as an outgroup. A heuristic analysis of the data matrix yields 36 shortest length trees. The strict consensus tree indicates that all these endemic spiders fall into one of three clades. These clades are well defined in our analysis, and occur in all 36 shortest length trees in the same relative position.

** Epigynal plugs and variation in the Genus *Eperigone*

Robert L. Edwards, Box 505, Woods Hole, MA 02543

Several traditional measurements, including TmI, and the color patterns of several species of *Eperigone* were examined to determine their usefulness in separating species, both as adults and immatures. The value for TmI and the color pattern on the abdomen were found to be the most useful characters. The male palpal tibia lengths and widths showed considerable variation in absolute and relative terms. Females of three of the species examined had epigynal plugs. These plugs are described.

** Effects of intraspecific density and predation pressure on a habitat shift in the wolf spider *Gladicosa pulchra.*

Micky Eubanks, Gary L. Miller. Department of Biology, The University of Mississippi, University, Mississippi 38677

Preliminary studies of the wolf spider, *Gladicosa pulchra* (Lycosidae), indicated that this species undergoes a habitat change as it nears sexual maturity: moving from the forest floor to trees in the fall. Age related habitat changes (ontogenetic niche shifts) such as this may occur in response to competition between conspecifics or size-specific predation. Two field experiments were conducted to investigate (1) the effects of increasing intraspecific density and (2) the effects of increasing predator density on the habitat change of *G. pulchra.* The numbers of conspecifics or predators were manipulated inside of 60 cm diameter tin enclosures placed around trees. Climbing behavior of *G. pulchra* was observed. Increasing intraspecific density had little effect on the habitat change, but increasing predator density significantly increased the incidence of climbing in females. This is one of the first studies to demonstrate sex differences in response to predation pressure. These studies support earlier work that suggests that intraspecific competition has little or no effect on the fecundity or survival of spiders.

** Follow the DNA Road: Costs, Benefits, and Forecast for Arachnology

Victor Fet. Department of Biological Sciences, Loyola University, New Orleans, Louisiana 70118

The 1980s brought to the molecular labs the powerful tools of restriction enzymes, recombinant DNA cloning and DNA sequencing, followed by the breakthrough technique of polymerase chain reaction (PCR). We can now estimate molecular variation within and among populations and trace their historical routes ("phylogeography" of John Avise). Mitochondrial DNA (mtDNA) holds a strong "ideological" position: its maternal inheritance permits to assess genealogical lineages. One of the most striking discoveries of 1988-89 was that PCR can amplify specific DNA fragments from dried and preserved specimens! PCR is now employed in several labs to amplify DNA from scorpions and spiders. Costs: high as compared to non-molecular systematics, especially for set-up lab (PCR machines range from $3,000). Benefits: to have your hands on the molecular heterogeneity especially in order to check biogeographic hypotheses (vicariance vs. dispersal, island colonization etc); difficult cases in taxonomy (sibling species); phylogenies; intraspecific variation; and patterns of gene flow. Forecast: Though costly, in a few years these techniques will become routine. The choice of the best organisms and hypotheses is crucial. I imagine a network of joint projects: as systematic arachnology becomes molecular it can no longer be an individual science.

** Adaptive Radiation Among Hawaiian Spiders,