1985 and 1986 MEETING DATES

An arachnological history, notes on spider natural history, accounts of members' field experiences, taxonomic commentary, and suggestions for new or improved research and curatorial techniques. Such articles make for useful and interesting browsing. Thanks to the efforts of John Dalingwater, the volume also has a 40 page index that permits it to be effectively used as a reference. The first part of this index lists titles, topics, and key words of articles and the second part consists of a phylogenetic listing of spider families, under which genera are alphabetically listed. The cost of this volume is approximately $25.00. Those interested in purchasing a copy should contact Dr. John Dalingwater, Treasurer of the British Arachnological Society, Department of Zoology, The University, Manchester M13 9PL, England, to obtain current information about availability and price.

BRITISH ARACHNOLOGY SOCIETY NEWSLETTERS REPRINTED

Under the editorship of John R. Parker, the British Arachnological Society recently published a 426 page, indexed, facsimile collection of their newsletters numbers 1-30 (July 1971 - March 1981). Like recent issues of the newsletter, these back issues contain articles on Taxonomy, Systematics, Natural History, Zoogeography, and other subjects of interest to arachnologists. The cost of this volume is approximately $30.00. Those interested in purchasing a copy should contact the British Arachnological Society at the address above.

All future meetings of the A.A.S. will be national or international -- eastern and western divisional meetings are a thing of the past. The next two national meetings will be held in Los Angeles (1985) and St. Louis (1986), both in late June.

The Los Angeles meeting will be held at the Natural History Museum of Los Angeles County. The Arrangement Committee includes Blaine Hebert, Lowell Herbrandson, and Charles Hogue. Tentative dates are 24-28 June (Monday - Friday) with registration on Monday and a field trip on Friday. A symposium on "Biology of Scorpions" is being considered for this meeting with Gary Polis as organizer.

The St. Louis meeting will be held at nearby Lindenwood College. William Tiejen will be the host. This meeting will occur more than two months prior to the X International Arachnological Congress in Spain.

GUILD OF NATURAL SCIENCE ILLUSTRATORS

The following information sent by James Cokendolpher may be of interest to the many arachnologists who do their own illustrations. The Guild of Natural Science Illustrators, Inc. is a non-profit organization for "those earning a living in part or whole by the rendering of scientific illustrations." Membership dues are currently $25.00 per year and entitle one to 10 issues of the organization's newsletter and attendance at 9 monthly meetings held in the Washington, D.C. area. Further information about the organization may be obtained by writing GNSI, P.O. Box 652, Ben Franklin Station, Washington, D.C., 20044.

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ERIGONINAE & LYNCHINAE CATALOGS

A catalog and synonymy of the Erigoninae of America north of Mexico has just been completed in rough form with about 100 genera and 680 species. No plans are being made to publish this, but the catalog and copies will be available at cost when typing is completed.

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REPORTS ON ONGOING RESEARCH

As I put the final touches on this, my first, issue of American Arachnology, I am encouraged by the willingness of the society's members to provide reports and items of interest. I welcome comments on the newsletter and suggestions for new features. George Uetz has volunteered to write an arachnological gossip column. However, after looking over a sample of his entries, I have decided to table this idea until we really run short of material--an action always an opportunity to renew friendships, meet new workers. The members whose behavior George has observed during the society's last ten meetings. I am continuing the "Reports on Ongoing Research" feature started by Bill Shear in the past issue. Each of the next several newsletters will profile the research programs of six or seven arachnologists with an attempt being made to achieve a balance among areas of research. As always, requests for specimens and information about plants and observations are welcome.

For me this summer has involved more than my usual share of travel. Before the New Orleans meetings, I paid a short visit to Joseph Connodtton at the Smithsonian Institution where I was able to view our nation's nascent spider collection. August began with a return to the familiar library of the American Museum of Comparative Zoology and a relaxing visit with Herb and Lorna Levit at their home in Peppertree. It ended with my first visit to the American Museum's Southwestern Research Station near Portal, Arizona. Thanks to the help of Vincent Roth, I was able to locate and study the wonderful tarantula specimens first described from this region by Gertsch and Muma. As if this weren't exciting enough, I was able to spend a few days with both Willis Gertsch and Martin Muma who live near Portal. John Cooke was also at the field station photographing and studying tarantulas and tarantula hawks, making this the largest assembly of arachnologists since the June meetings.

Attending meetings and visiting other arachnologists is always an opportunity to renew friendships, meet new workers, learn about ongoing research, and recharge one's enthusiasm. I hope that this newsletter will continue to achieve these same ends. -- Brent Opell

VINCENT ROTH'S HANDBOOK FOR SPIDER IDENTIFICATION

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Region of Mississippi. These specimens were collected primarily in pitfall traps by Tim Lockley and cover all seasons of the year. This collection and a collection on loan from the Mississippi State Entomological Museum have provided a view of the lycosid fauna between Florida (well-collected) and east Texas (not-so-well-collected). Among the specimens are males of *Gladiolus bellam* (the first males that I've seen) together with several females (known only from type specimens). I mention this because it underscores the need for adequate regional collections from areas outside of the northeastern United States.

Another small project involves an updat of the genus *Trochosa*. I have collected one new species in the ayara group from Texas. The new species is represented by 6-8 specimens and needs to be illustrated and described. Another species *Lycosa apacheanica* Wallace also belongs to the ayara species group and will also be illustrated and re-described.

Longer range plans are to continue with a systematic revision of the "species-groups" that have been tentatively separated from what is now known as *Lycosa*. Once these species groups or genera (as they may prove to be) have been established, an overview of their evolutionary relationships will be presented.

CLUSION

JAMES E. CARICO
Department of Zoological Sciences
University of Texas
Austin, Texas 78712

My current research on spiders includes two behavioral investigations. One is a laboratory study of vibrations in spider webs, primarily those of orb-weavers. Using a photodiode to detect light deflected from the web, we are developing methods to record and analyze web vibrations and to investigate the transmission of vibrations by orb-webs. The questions I hope to investigate with this system concern the transmission of vibrations on the web, especially within a species. The system is designed to record vibrations at frequencies up to 100 kHz and 500 Hz. Observations so far indicate that low-frequency vibrations up to 100 kHz are most significant. Transmission effectiveness appears to change with web tension, web structure, and position of the spider.

In a continuing study of web aggregation and social behavior in spiders, I have been measuring the variability in web building, aggressive behavior, and site tenacity of spiders that build their webs in groups. Orb-weaving spiders that live in groups modify their web structure, while solitary spiders tend to build more individually distinctive webs continuously from day to day. In colonial spiders, individual variability in web construction and activity appears to increase with spider density and higher food levels.

A separate part of my research position involves interdisciplinary work between biology and geophysics. As an outgrowth of this work, I have become interested in biogeography and phenology of spiders, particularly in Texas, Central America, and the Caribbean, as they are related to climatic and geological history.

JEROME S. ROVNER
Department of Zoological Sciences
Ohio University
Athens, Ohio 45701

Currently I am investigating how ground-dwelling spiders survive floods resulting from heavy rain or overflow of streams. While some wandering spiders are known to climb vegetation or seek higher ground to escape rising water, what of those spiders inhabiting silken retreats at or beneath the surface? Do they have behavioral or morphological adaptations enabling them to resist drowning when submerged? (I leave possible physiological adaptations to John Anderson or Ken Prestwich.) Although considerable interest has been directed toward coastal (intertidal) species and toward the genus *Arachnophora*, little is known about *Arachnophora aquaticas* in this regard. Inland terrestrial spiders have not been the primary subject of such studies previously.

Two species have received much of my attention: members of *Arachnophora aquaticas* often build sacs, especially for molting, of individuals of *Arachnophora aquaticas* build a tube or web. I have been comparing survival times between individuals without vs. within their silken construction after the spiders' submergence in aerated water (20-25°C). Outside the retreat they drown within 18-36 hr, while those in retreats survive for a number of days. The highest figures for *L. aquaticas* (10...
The primitive spiders—liphistiids and mygalomorphs—whose physical gill during floods. My preliminary observations show that the constructions of spiders not associated with an aquatic lifestyle can function like the web of Argyroneta aquatica, heretofore the only spider examined specifically in regard to the use of silk for maintaining an air store and a physical gill. I've begun to look at other spiders that occur beneath stones, logs, or debris to see how they react to submersion. These spiders include not only some that build sac or tubular retreats (e.g., Clubiona spp.) but also some that build snares (e.g., Amaurobius spp.) and some not associated with any such use of silk (e.g., Lycosa and Dysderidae spp.).

In regard to Lycosa spp. I'm particularly interested in the species' population genetics of the South American cooperative theridid, Anelosimus eximius. I'm interested in the influence of inbreeding within colonies on social behavior, and the effect of A. eximius social system on the species' population genetics structure. The question I want to answer about the colonies' highly inbred, and thus made up of genetically similar individuals? and, if colonies are indeed, isolated lines, does this lead to division of the species into genetically isolated populations?

I will be carrying out field observations on colony founding sites, and collecting animals from Suriname, Panama, Trinidad and Ecuador. These animals will be used in protein electrophoretic studies of genetic variation among populations, and (hang on to your hats!) studying mitochondrial DNA variation within populations and within colonies.

I did a pilot electrophoretic study past year, using A. eximius I'd collected form Panama and Suriname. The results of this pilot study will come out in the issue of J. Arachnology containing the papers's presented in George Uetz's symposium on social spiders. The results of this pilot lead me to believe that colonies are highly inbred, and that migration by adult males among colony clusters is rare or non-existent. Also, the Panama and Suriname populations that I sampled did show fixed differences indicative of possible genetic isolation. I will begin a new project on population genetics of the South American cooperative theridid, Anelosimus eximius. I'm interested in the influence of inbreeding within colonies on social behavior, and the effect of A. eximius social system on the species' population genetics structure. The question I want to answer about the colonies' highly inbred, and thus made up of genetically similar individuals? and, if colonies are indeed, isolated lines, does this lead to division of the species into genetically isolated populations?

Now, I would like to know if colonies are founded by single female lineages or by several unrelated females; and if the fixed differences I found between Panama and Suriname populations are an indication of genetic isolation of specific populations, or just a result of small sample size. The latter is best approached with further protein electrophoresis studies, in which I will try to examine genetic variation in the species by sampling as much of the species range as possible over the next few years, and partitioning genetic variation into the components due to subdivision of the population into colonies, colony clusters, local populations and geographic regions. The pilot suggest that most variation can be attributed to subdivision of the population into colonies, colony clusters, local populations and geographic regions. The pilot suggest that most variation can be attributed to subdivision of the population into colonies, colony clusters, local populations and geographic regions.

But because the species is genetically very uniform at the level of the local populations, I cannot use protein electrophoresis to study colony foundation. I'm going to try to use mitochondrial DNA studies for this. Here I must thank Dr. David Macauley at Vanderbilt University for suggesting this line of research to me. Animal mtDNA typically evolves 5-10 times faster than nuclear DNA (the stuff that produces the proteins studied in protein electrophoresis), it's maternally inherited (all your mitochondrial DNA comes from your mother), and it doesn't undergo recombination. As a result, it is inherited intact (except for mutations) along maternal lines. I hope to be able to detect more variation within local populations by looking at mtDNA variants, and to be able to determine if colonies are typically made up of individuals descended from a single maternal lineage. This electrophoretic and mtDNA
work will be carried out in collaboration with Dr. Wesley Brown, here at the University of Michigan.

I'm also getting interested in sex ratios in cooperative spiders. I will with getting primary sex ratios of social species (that is, A. eximius) and related solitary and sub-social species by analyzing eggs. I've received much needed help on this from Wayne Maddison (Harvard), Judy Brown (Midwestern State University) and Dr. William L. Brown (Cornell).

I've also prepared to argue that there are far more Browns than Smiths in the scientific community.

CARLOS E. Valerio
Escuela de Biología
Universidad de Costa Rica
Ciudad Universitaria Rodrigo Facio
Costa Rica

I keep my interest in the mygalomorph spiders of Costa Rica and adjacent areas. I have four new species ready to be described, to add to a long list of 33 species from this area. These new ones are mostly small-sized tarantulas except for one handsome Brachypelma. I also know of the existence of three more species, represented in our collection by females only, which make generic placements uncertain and I am waiting for the males to show up (this is almost literally true, working with tropical tarantulas with low population densities).

I have also been interested in a group of five species of diurnal ctenids, small forest-floor dwellers that behave pretty much like lycosids and occur sometimes in high densities. They key out as Psychomisus based on available keys and descriptions, but I found them very different from the typical species of that genus (large nocturnal and arboreal), also common in the forests here. It seems that one would have to solve the confusion at generic level before this interesting group is finally studied.

Bill Eberhard (my next-door neighbor, in the Escuela de Biología) and I are planning to teach a tropical spider course, sometime in 1986. We will let you know details in case somebody wants to join us. I have been accumulating data on the reproductive biology of the curious Siaurcus puncoos from the dry Pacific lowlands in Costa Rica (other species in South America are from high altitudes), and I think I have enough for a paper now.

I am planning to dedicate most of my spider time next year to do curatorial work with our growing arachnid collection in the Museo de Zoología, since we have been accumulating large numbers of ctenids, lycosids, and, the toughest job, forest-floor ctenids, small forest-floor dwellers that behave pretty much like lycosids and occur sometimes in high densities. They key out as Psychomisus based on available keys and descriptions, but I found them very different from the typical species of that genus (large nocturnal and arboreal), also common in the forests here. It seems that one would have to solve the confusion at generic level before this interesting group is finally studied.

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dedicated to arachnological purposes and no part of the net income or assets of this organization shall ever be distributed to any director, officer or member thereof or to the benefit of any private individual. Upon the dissolution or winding up of the corporation, its assets remaining after payment of all debts and liabilities of this corporation shall be distributed to a non-profit fund, foundation or corporation which is organized and operated exclusively for arachnological purposes and which has established its tax exempt status under Section 501(c)(3) of the Internal Revenue Code. The non-profit fund, foundation or corporation which is to receive the assets is selected by the Executive Committee or vote of membership. If this corporation holds any assets in trust, or corporation if formed for charitable purposes, such assets shall be disposed of in such manner as may be directed by decree of the superior court of the county in which the corporation has its principal office, upon petition therefore by the Attorney General or by a person concerned in the liquidation, in a proceeding to which the Attorney General is a party. The purposes contained in this paragraph are limited to those meeting the requirements for welfare exemption under Section 214 of the Revenue and Taxation Code.

BY-LAWS

ARTICLE I Membership
Section 1: Membership shall be open to all persons who make formal application and pay the prescribed dues, and who are willing to abide and uphold the Constitution and By-Laws of the Society.
Section 2: Institutions may not become members, but may subscribe to publications.
Section 3: Dues shall be paid upon receipt of an annual bill.
Section 4: All members in good standing have the right to vote.
Section 5: Any members in good standing is eligible to hold office.
Section 6: A member whose dues have not been paid within the grace period of two months of the due date shall be delinquent and shall lose the privileges of membership, and such members may be reinstated upon payment of delinquent dues.
Section 7: The services and privileges of membership shall include the following:
1. Subscription to all publications
2. Vote in accordance with the By-Laws.
3. Membership in all activities and functions of the Society.
Section 8: A class of Honorary Membership shall be established. An individual may be elected at the annual business meeting by a vote of the membership. The number of Honorary Members is not to exceed 5% of the total membership. A list of these Honorary Members is to be published annually in the newsletter of the Society.

ARTICLE II Officers
Section 1: The elective officers shall consist of: President, President-Elect, Secretary, Treasurer, and a three member Board of Directors.
Section 2: The elected officers, Membership Secretary, and Board of Directors shall serve as the Executive Committee. Fifty percent of the Executive Committee represents a quorum.
Section 3: The Executive Committee shall be elected by a majority of votes cast in a mail ballot.
Section 4: Officers and Directors shall serve for two years, or until their successors are elected. Beginning in 1977 and every other year thereafter, the incumbent President-Elect shall assume the presidency, and the incumbent President shall continue on the Executive Committee as one of the Directors. A new President-Elect, the Treasurer, and one Director shall also be elected in these, the odd-numbered years. On the alternate, even-numbered years, beginning in 1978, the Secretary and one Director shall be elected.
Section 5: An Officer or Board of Directors member may be renominated but may not serve for more than two consecutive terms in the same office.

Section 6: The President shall preside at business meetings of the Society and Executive Committee. He shall appoint all committee chairpersons as the need arises. The Executive committee shall appoint all committees.
Section 7: The President-Elect shall assume the duties of the President in his absence at business meetings, and shall become President in the event of death, resignation or disability of the President. In the event of the absence of both President and President-Elect at a business meeting, any member of the Society duly chosen by the members present at that meeting shall preside.
Section 8: The Secretary, or his delegate shall keep minutes of the proceedings of all Society business meetings, conduct official correspondence and maintain an on-going record of Society affairs.
Section 9: A treasurer shall keep the financial records, accept monies, issue bills, pay bills and maintain the bank accounts. The account shall be subject to annual audit by a committee appointed by the Executive Committee. An annual financial statement shall be published in the newsletter of the Society.
Section 10: The membership Secretary shall be appointed by the Executive Committee, and shall serve until replaced. The Membership Secretary shall keep membership records, issue dues renewal notices, and accept dues and transmit them to the Treasurer for deposit. Starting in 1975 the complete membership of the Society shall be published in the newsletter of the Society every 2 years.
Section 11: Publication policy shall be the responsibility of the Executive Committee, which shall also appoint the Editor of the Journal. An Editorial Board shall be appointed by the Editor to assist in the review process.
Section 12: Election of Officers and Board of Directors shall be held as provided for in Art. II, Sec. 4 of these By-Laws by a mail ballot. The ballots shall be counted by three members appointed by the President. The nominees for each office shall be selected, either by a nominating committee or by vote of the membership. A list of nominees shall be published at least 60 days prior to the annual general meeting. Nominations for officers shall be received, in writing, to the Nominating Committee their willingness to serve, and a list of nominees shall be published. Following the annual general meeting, the elected officers shall be installed.

ARTICLE III Meetings
Section 1: There shall be an annual general meeting of the Society open to all members. The date, time and place to be determined by the host(s) and coordinated by the President-Elect.
Section 2: The membership shall be informed of the date, time and place of the annual general meeting at least three months prior to the meeting.
Section 3: Special meetings of the Executive Committee may be called by the President.
Section 4: An annual business meeting open to all members will be held in conjunction with the annual general meeting at a time to be designated by the President.
Section 5: Additional meetings may be called by the Executive Committee or by the request of twenty or more members.

ARTICLE IV Dues
Section 1: Annual dues for regular members shall be an amount fixed by the Executive Committee and duly announced to the membership.
Section 2: Institutional subscriptions shall be an amount fixed by the Executive Committee and duly announced to the membership. Journal subscriptions may be exchanged with other professional societies that publish a journal.
Section 3: Student membership shall be an amount fixed by the Executive Committee and duly announced to the membership.
REPORTS ON THE 1984 MEETINGS

AMERICAN ARACHNOLOGICAL SOCIETY
NEW ORLEANS, 1984

Report by Louis Sorkin

The World's Fair opened in New Orleans this past summer and so did the international meetings of the American Arachnological Society at the campuses of Loyola and Tulane. Our host this season was Terry Christenson and both he and his assistants did much to make these meetings successful. About 100 members and guests attended.

The arachnophiles came from the United States, South Africa, Costa Rica, France and Panama to partake of the sixty presented papers, including a symposium on spider social behavior organized by George Uetz and a poster session about two students' research interests. The registration packet supplied to all attendees contained details of meetings, abstracts of papers, and listed highlights of the city's tourist attractions for the uninitiated. It also contained an abbreviated glossary of New Orleans lingo to assist the visitor on his or her travels through the Crescent City.

The papers dealt with many aspects of arachnid systematics, behavior, genetics and ecology, a few choices are listed here: "Studies on the host-parasitoid relationships of the mygalomorphs and their internal cicadiform parasitoids, the Acroceridae" (Everett Schlinger); "the simple-eye of the spider -- another perspective" (Nancy Heiss); "Life history studies of Paruroctonus nannus" (Lynne Francke); "spider nests maintain a physical gill: flooding and the evolutionary origin of silk" (Jerome Royner); "Achaearaneae wax" (Yael Lubin) and a paper entitled, "on the Gallennillidae" (Norman Blank). (Yes, it's spelled correctly.)

Social get-togethers occurred spontaneously, and such events centered around an informal slide presentation on Friday evening, hosted by various salticidologists (Wayne Maddison, Charles Griswold, Dave Richman and others). Scheduled events included a special at the Christenson home on Wednesday evening and a cajun-style banquet dinner on Thursday. At the latter, three guest speakers primed the audience for upcoming field trips by lectures and slide presentations depicting the bayou flora and fauna and herpetile fauna that one should keep an eye out for while looking for spiders.

Those attending the meetings were also treated to southern-style downpours, which occurred like clockwork at the end of every day's paper sessions. Fortunately, this did not dampen the spirits of those who were on their way to the Wolf Den for a dressed Po-Boy, a mug of Dixie, and an arachnological discussion with other rain-soaked arachnologists.

STUDENT PAPER AWARDS

This year's award for the best student paper presentation was shared by two students. Leticia Ayllon of the Museo Ecuatoriano de Ciencias Naturales was recognized for her paper entitled "A new psuedoscorpion spider" and Karen Gallo of the University of Cincinnati for her paper entitled "The effects of juvenile experience in the social structure of Metepeira spinulosa.''

ABSTRACTS FROM THE 1984 MEETINGS

BUSKIRK, Ruth E.
VARIABILITY IN WEB-BUILDING AND FORAGING IN COLONIAL ORB SPIDERS
University of Texas

Orb-weaving spiders that live in groups modify their web structure and activity periods, in contrast to solitary araneids which build more individually distinctive webs. Individually marked spiders (n=62) of the colonial Metepeira gravida (Araneidae) in Costa Rica were monitored for 5-day periods during which all webs spun were measured. Variation in web characters (particularly web angle and viscid spiral) within an individual was related to density of spiders, feeding history, and time of day. Some web measures differed by over 60% within a 24-hour period. In a model that appears to explain both within-species and between-species variation, long-term factors such as patchy web-attachment sites, food distribution and climatic protection account for increased success of aggregated spiders. In the short term,
individual variability in web construction increases with both spider density and food supply. Species with greater ability to modify individual foraging strategies are more likely to be facultatively social.

**DARCHEN, Roger and DARCHEN, Bernardatte**

**LEVELS AND SCHEMES OF EVOLUTION IN SOCIETIES OF SPIDERS COMPARED TO THE SOCIETIES OF INSECTS**

Univ. de Paris, France

Since the beginning of studies on the social behaviour of spiders, the structures discovered in these invertebrates have often been compared with those already known for a long time in insects.

A preliminary conclusion might be that the degree of evolution of spider societies is significantly lower than that of insect societies. We may think that the social evolution in spiders has developed along an original track, which has rarely been followed in the animal kingdom (insects, birds, mammals, etc.).

This approach, which excludes the dominance and hierarchy of individuals, actually seems to correspond to a human ideology, and is paradoxically catalogued among inferior societies. It would seem that this type of egalitarian society is difficult to achieve in nature, because it is quite rare; and spiders, whose societies are based on this principle, are in fact very few species.

**KRAFFT, Bertrand, Jean Michel JULIATA, and Andre NOREL**

**SOCIALIZATION PROCESS IN SPIDERS: INFLUENCE OF TROPHIC FACTORS ON THE LENGTH OF THE GREGARIOUS PHASE IN COELOTES TERRESTRIUS**

Univ. de Nancy, France

In spiders, the modes of organization range from solitary to social states. "Subsocial" spiders represent intermediate steps where young disperse before being adults, often a gregarious phase which has been accorded to the species. Why does social life stop in these species? Several arguments in literature lead us to imply trophic factors and to formulate the following hypothesis: food requirements increasing together with the young's growth, the resources of the environment exploitable by the colony get locally insufficient, thus making the spiders' emigration necessary.

In natural conditions, the spiderlings of *Coelotes terrestris* clusters with their mother for about one month. The feeding of this species in the laboratory gave the following results:

- Prey consumption increased along with the young's development.
- Feeding of fed clutches showed a gregarious phase twice as long as that of less fed clutches.

These results are discussed in the hypothesis of an intervention of trophic factors in the evolution of spiders' societies.

**LEIBN, Yael**

**COURTSHIP AND MATING BEHAVIOR IN A SOCIAL SPIDER: WHAT IS THE FUNCTION OF COURTSHIP?**

Smithsonian Tropical Research Institute, PANAMA

There are three ways for males to attain copulations with females in the social spider, *Acantharanea wuvi* Levi (Therididae). Males may court females on display arenas near the center of the colony, they may attempt to mount females without prior courtship, or they may attempt to "rape" mating or recently-mated females. Males also engaged in ritualized fights and displaced another from the display arena. Observations of successful matings following courtship displays were rare; there were, however, numerous instances of rape. Males mated in locations and at a rate that suggests that they attempted to minimize the likelihood of being discovered by a male.

The probabilities of obtaining copulations with and without courtship were calculated from observations of males in several colonies and at different stages of the reproductive season. These figures are used to estimate the overall expected utility of mating with and without courtship as a function of the probability of "survival" of a male between activity bouts.

**RIECHERT, Susan**

**THE COSTS AND BENEFITS OF COOPERATIVE BEHAVIOR**

University of Tennessee

The costs/benefits of cooperative versus competitive behavior were assessed for the central african spider, *Agelenopsis consociata* (Agelenidae). In this species, group living appears to limit both individual energy intake and subsequent reproductive output. It is favored, however, 6 months of the year when damaging rains necessitate web construction an average of 2 out of every 5 days. On these days, energy expenditure by solitary *Agelenopsis* is far in excess of energy consumed. Since efficient trap area is a curvilinear function of spider numbers, individual spiders living in cooperative groups need expend significantly less energy in web-building activities than individuals maintaining solitary webs. Potential cheating and the loss of individual reproductive success are of no consequence in this case of cooperative behavior, since *A. consociata* within colonies are, for the most part, genetically identical.

**RYSTRA, Ann L.**

**THE ROLE OF PREY ABUNDANCE IN THE EVOLUTION OF SPIDER SOCIALITY**

Miami University

Prey abundance is frequently considered important to the early stages of social evolution in spiders. In a series of enclosure experiments conducted with non-social spider species, normal spacing mechanisms such as territories disappeared when an excessive number of insect prey were supplied. Although the number of aggressive actions observed remained fairly high, the proportion of those actions that resulted in cannibalism dropped to zero. In those experiments, non-social spiders could be maintained at densities characteristic of highly social species. In another study the formation and maintenance of natural aggregations of *Nephila clavipes* (L.) were shown to be prey dependent, but cannibalism was observed in this species, however individuals with the lowest capture rates within a colony stepped up their aggression levels prior to dispersing out of the group. In some cases sufficient prey is necessary to reduce the need for cannibalism in hungry spiders so that other kinds of interactions can develop.

**SMITH, Deborah R. R.**

**EFFECT OF SOCIAL BEHAVIOR ON THE POPULATION GENETICS OF ANTELOMUS EXIMIUS (THERIODIDAE)**

Cornell University

Anelomus eximius is a cooperative group-living spider found in tropical rainforest habitat. Colonies may contain up to 1000 or more individuals, and several colonies may occur together in close proximity, forming a "colony cluster". These colony clusters are patchily distributed, often separated by 2-5 km or more. Observations by previous workers suggest that 1) a new colony is founded by a single queen, or a small group of mated females; 2) a colony cluster forms from a single colony which grows and fissions; and 3) there is little or no exchange of either adult males, or of other age-sex classes among colony clusters, although it is possible that individuals move freely among colonies within a cluster. If these hypotheses are correct, one expects to find 1) a high degree of genetic similarity within colonies and colony clusters; 2) some degree of genetic differentiation among colony clusters due to founder effects and drift; and 3) pronounced differentiation among geographically distant populations, perhaps to the extent of the formation of cryptic species. These hypotheses are tested using horizontal starch gel protein electrophoresis of individuals collected from Panama in August 1983, and from Suriname in April and May 1984.

**TIEDEN, William James**

**STATISTICS OF SPATIAL DISTRIBUTION**

Lindenwood College
Simulations of spatial distributions and data on the distributional patterns of the social spider *Mallotus spadalis* and the solitary spider *Frontinella pyramitela* are compared using several statistics of dispersion (variance to mean ratio, block size analysis, Morisita's index, nearest neighbor analysis) to assess differences. Circular statistics were insufficient to evaluate the spatial organization between populations that can only be observed. Dispersal of colony genes, by fertilised females, occurs. Behaviors attributable to differences in genetic makeup. Behavioral plasticity, or the result of genetic mechanisms inherent in different populations. Spiders from source populations in desert and moist tropical habitats were collected as eggs and raised in the laboratory under identical conditions. Measurements of three-dimensional spacing parameters in laboratory colonies (nearest neighbor distance, within-colony density) have shown significant differences in spatial organization between populations that can only be attributed to differences in genetic makeup. Behavioral observations confirm that there are several behavioral ecotypes within this species, with levels of sociality adapted to the regions in which they occur.

**UETZ, George**

**GENETIC DIFFERENCES IN SOCIAL SPACING IN *METEOPHRA SPINIFEX*, A COMMUNAL TERRITORIAL ORB WEAVER**

University of Cincinnati

*Meteopha spinifex*, a communal/territorial orb-wreaver from Mexico, shows considerable geographic variation and temporal flexibility in group size and social spacing. A series of laboratory studies was conducted to test whether the variation observed in the field is the result of behavioral plasticity, or the result of genetic mechanisms inherent in different populations. Spiders from source populations in desert and moist tropical habitats were collected as eggs and raised in the laboratory under identical conditions. Measurements of three-dimensional spacing parameters in laboratory colonies (nearest neighbor distance, within-colony density) have shown significant differences in spatial organization between populations that can only be attributed to differences in genetic makeup. Behavioral observations confirm that there are several behavioral ecotypes within this species, with levels of sociality adapted to the regions in which they occur.

**VOLRATH, Fritz**

**SOCIALITY AND SEX RATIOS**

Oxford University, England

The theridid *Aelosoma eximium* is a social spider: individuals of all stages inhabit one web, tolerant of one another; they hunt together and share the prey; generations overlap. It appears that the reproduction in a colony is generally by inbreeding and that outbreeding is a very rare occurrence. Dispersal of colony genes, by fertilised females, is infrequent. The closely related look-alike *H. iucundus* is subsocial, the young leave the maternal web as soon as they reach maturity and disperse. It appears that outbreeding, mating after they have left the maternal web. Colonies of *A. eximium*, like other social spiders, produce more females than males. Primary and tertiary sex ratios are skewed (1:1). The sex ratio in *A. eximium* is 1:1. A combination of several factors might have contributed to the selection for uneven sex ratios, mainly: (1) inbreeding and (1) participation at work. (1) Few males contribute to colony labour. Increased production of females allows larger colonies to be constructed and maintained. The larger the colony the better its chances of survival. The skew in sex ratio is achieved is of particular interest since *A. eximium*, like other spiders, appears to be diploid in both sexes.

**ABSTRACTS: PAPER AND POSTER SESSIONS**

**ALL, A. D. AND T. E. REGAN**

**SPIDERS IN LOUISIANA SUGARCANE ECOSYSTEMS**

Louisiana State University

Sixteen families represented by 39 genera and at least 40 species were captured in sugarcane fields over a 2-yr period. Sampling was with pitfall traps, D-Vac, and whole plant visual observation. Spiders, together with the imported fire ant, *Solenopsis invicta* Buren, form the major predator complex of *Diatramasaccharinae* (Fabric) the key insect pest in Louisiana sugarcane ecosystems.

**AYLES, Leticia AEBUTINA BINITATA: A NEW QUASSISOCIAL SPIDER**

Hueso Ecuatoriano de Ciencias Naturales, Quito

*Aebutina binotata* Simon, a species probably belonging to the Dicytidae, has been found to live in aggregations that show a degree of tolerance, cooperation and interaction that would place this spider among the few ones that have attained the highest degree of social behavior known among spiders. Aggregations of this spider are found inhabiting the undersurface of leaves in the Amazonian tropical rainforest. Through a cooperative effort this spider turns up the leaves it inhabits in natural snare for any insect landing on them. Several spiders participate in prey capture and feeding on the prey is communal. Brood care is also cooperative. Colonies are composed by a number of females that have laid each one a single egg sac and that remain together as their offspring grow. As during this process most adult females disappear (die?), the offspring are raised by females not necessarily their own mother. It has not been observed whether reproduction occurs exclusively among the members of the same colony, though the presence of female biased, sex ratios suggests this to be so. Several other similarities with other quassisocial spiders, despite few differences, shows that we are faced again with the interesting problem of quassisociality in spiders for which we are still in search of an answer.

**AYAGARI, L. Rao and TIETJEN, W. J.**

**DOES THE JUVENILE PARDOSA MILLYNA (ARANEAE: LYCOSIDAE) SPIDER CONTAIN AN INACTIVE PRECURSOR TO THE ADULT SEX PHEROMONE?**

Lindenwood College

In some arachnids the immature females release a sex pheromone. Immature spiders may release such a pheromone or wait until the final molt. At the biochemical level, pheromone synthesis most likely involves the synthesis of a precursor by juvenile females before they undergo chemical modifications to produce an active compound upon molting to the adult stage. This hypothesis is tested on juvenile and adult *Pardosa millyna*. Pheromone was extracted from silk deposited on filter paper by immersion in hexane for 15 min and analyzed on a florisil column. Hydrocarbons and oxygenated compounds were eluted with hexane and diethyl ether respectively. The hydrocarbon fraction was further separated on a florisil column impregnated with *Silver nitrate* and *Silver nitrate* was used to determine the relative plesiomorphic or apomorphic status of the *Pardos* character states. Each compound in the isolation was tested using bioassay techniques (adult males only). Further characterization of the active pheromone components will be presented and the presence or absence of a precursor in juveniles will be discussed.

**BENNETT, Robert G.**

**THE PALPUS OF MALE NADOTES CHAMBERLIN SPIDERS (ARANEAE: AEGLENIDAE): A COMPARISON OF THE NEW GENUS GLYCOSA WITH OTHER LARGE NORTH AMERICAN LYCOSIDS**

Western Carolina University

The structure of the palpus of male spiders of the genus *Nadotes* is discussed. A cladogram of species relationships for the genus is erected based upon a study of male palpal characters. Homologous characters in the palpi of species of *Corax* Simon are used to determine the relative plesiomorphic or apomorphic status of the *Nadotes* character states.

**BRADY, Allen R.**

**A COMPARISON OF THE NEW GENUS GLYCOSA WITH OTHER LARGE NORTH AMERICAN LYCOSIDS**

Hope College

The new lycosid genus *Glycosa*, most of whose member species were formerly described under *Lycosa*, is distinguished by its distinct color pattern, structure of the male palpus and female genitalia, eye arrangement, and proportion of leg length compared to carapace length. An ingroup comparison of species has been made, as well as outgroup comparisons of *Glycosa* with representatives of other clearly defined species groups. New placed families follow purpose in establishing taxonomic characters in addition to structural features of the male palpus and female epigynum is not in order to provide another means of separating species within a group (e.g., *Identifying species of Glycosa*). Indeed its primary objective is to provide evidence for establishing generic boundaries. In some practical applications these additional
characteristics may provide a means for recognizing species placed in the wrong genus. Examples are seen in *Proconus* and *Ipfrochella*. In addition to color pattern and morphological features certain members of the genus *Glycosa* are distinguished by peculiarities in their ecology and behavior. *Glycosa pulchra* is often found resting on the lower trunk of trees. Information concerning behavior and habitat ecology of *G. bellandi* and *G. suaveolenta* are needed.

BROWN, Judy D. and Norman V. HORN
KARYOTYPING TECHNIQUES ADAPTED TO SPIDERS WITH PRELIMINARY RESULTS FOR COMMON SPECIES
Midwestern State University

Various spiders were karyotyped using Tokagid Oshimu's air-drying technique with slight modifications. Preliminary results suggest a high degree of species specific karyotypes. differences in spacing patterns and social organization. For example, tropical spiderlings hatch out alone. To test for differences in spacing patterns and social organization, juvenile experience has an initial effect on tolerance of conspecifics that may modify the model of this mechanism suggested by Rovner. Specifically, the dorso-ventral muscles of the opisthosoma appear to play a significant role in supplying hydrodynamic pressure required to expand the hematodocha.

CARREL, James F.
SPIDER SEDATIVES: DRUG EVALUATION OF METHAQUALONE AND THREE NATURAL QUINAZOLINONES
University of Missouri, Columbia

Four quinazolinone compounds were evaluated as sedatives in wolf spiders (*Lycosa spp.*). from south Florida. *Glomerin* and homoglomerin, both of which are present in the defensive secretion of the European millipede, *Glomeris marginata*, induced sedation of slow onset and prolonged duration at doses of 1-50 ug/spider. In contrast, neither methaqualone, a synthetic drug widely used as a human sedative/hypnotic, nor arborine (=glycosine), a natural product sedative to mammals, produced behavioral abnormalities at doses of 1-50 ug/spider. These results illustrate the limitations of using spiders in nomtheral evaluations of psychoactive drugs designed for human medicine. More importantly, they also illustrate the great potential for discovery of novel chemical interactions between spiders and other organisms, especially archtopred pray.

COYLE, Frederick A.
TWO-YEAR LIFE CYCLE AND LOW PALPAL CHARACTER VARIANCE IN A GREAT SMOKY MOUNTAIN POPULATION OF THE LAMP-SHADE SPIDER (*Araneus bicolor*, *Hylocidium*, *Hypochilus*)
Western Carolina University

Size-frequency histograms and other data generated from four samples (totaling 926 specimens) collected during a complete two-year study show that a *Hypochilus* population in the Great Smoky Mountains has a two-year life cycle with the following schedule: spiderlings emerge from egg sacs and construct their first webs in late May; 15 to 16 months later, during their second autumn, these spiders mature, mate and lay eggs. Populations are stable and adult body size variances of this population are very large. The coefficients of variation of three palpal dimensions in a sample of 38 males are significantly smaller than those of tibia I length or carapace length. It is suggested that such relative constancy of palpal characters within a population may be common in spiders and may result from stabilizing selection in one or both of the following forms: selection for the mechanical compatability necessary for effective sperm placement during copulation and sexual selection by female choice.

CRAIG, Catherine L.
THE USE OF MATERIAL AND MECHANICAL PROPERTIES OF ORB-WEB TO DETERMINE PATTERNS OF EVOLUTION AMONG THE ARANEOIDEA
Cornell University

Orb-webs are tensile structures that approximate minimum volume (perfect) designs. Through studying web architecture, web materials and their interactions, I have shown a range of independent, but restricted evolutionary pathways along which orb-webs differ. The lack of possible variation in web placement during copulation and sexual selection by female choice.

CRAIG, Catherine L. and Akira OKUBO
ENHANCEMENT OF PREY CAPTURE DUE TO ORB-WEB AND INSECT OSCILLATIONS
Cornell University

Orb-webs displace and oscillate at characteristic
frequencies and amplitudes as do the insects that webs snare. Web oscillations are independent of the spider and induced by non-steady airflow of surrounding winds. Insect oscillations are under insect behavioral control.

We measured web and insect movement patterns to determine if oscillations significantly affect prey capture. We found that the oscillatory behavior of low-impact webs greatly enhanced capture of slow-flying prey. However, oscillations of high-impact webs only slightly enhanced prey capture. The effect of insect oscillations on prey capture was small compared to the effect of web oscillations on capture enhancement.

FRANKE, Oscar F.
LIFE HISTORY STUDIES ON PARUROCTONUS MEGASENIS (SCORPIONES, YAEVIOIDEA): INDIRECT METHODS YIELD IRREPRODUCIBLE RESULTS
Texas Tech University
There have been two previous studies on the post-embryonic development of Paruroctonus megaseinis (Steinke, both of which relied upon indirect methods to determine the number of molts to maturity. Indirect methods are based on the presumed capture enhancement. We found that the oscillatory behavior of low-impact webs only slightly enhanced prey capture. The effect of insect oscillations on prey capture was small compared to the effect of web oscillations on capture enhancement.

FRITZ, Debbie
PARENTAL CARE, JUVENILE DEVELOPMENT, AND NESTMATE RECOGNITION IN MALLOS PERSEUS
University of Cincinnati
Mesannsi = 'formally attains sexual maturity at the seventh and eighth instars, there is no evidence of post-maturation molts, and maturity is attained not in three years but in five or more.

GILLESPIE, Rosemary G.
FORMATTING STRATEGIES AS RISK RESPONSES IN A SINGLE SPIDER SPECIES
University of Tennessee
The long-jawed orb weaving spider Tetragenatha elongata has been found to exhibit markedly different foraging strategies under different ecological conditions. Where prey availability is low, they adopt a "sit and wait" strategy; where high they are more active. I have applied Caraco's (1980) model of risk sensitivity to a variable environment to explain the phenomenon: Where the prey availability is less than the spider's physiological requirements, it should exploit the variability of the habitat and remain for extended periods at a suitable site ("sit and wait"). Where prey availability is above the spider's physiological requirements, it should exploit the average by a mechanism of continual sampling ("active search"). This idea is shown to be capable of explaining not only the foraging strategy that an individual should adopt in a given situation, but also many specific behavioral/ecological correlates.

GREENSTONE, Matthew H.
SPIDER BALLOONING: DEVELOPMENT AND EVALUATION OF TRAPPING PROTOCOLS
Biological Control of Insects Research Laboratory, Columbia, Missouri
Sticky wire traps and three types of flat sticky panel traps (mylar and half and quarter inch hardware cloth substrates) were operated for twenty-three weeks in a Central Missouri soybean field to see whether the largest and most representative samples of the aeronaut fauna. Weekly counts were subjected to multi-way analysis of variance of trap type, trap height, compass direction and sampling date. There were significant main effects for all factors except compass direction, but all factors were also involved in significant interactions. Nevertheless there is a clear numerical disadvantage for mylar panels in the fall, probably due to repetition of the adhesive on cold days. There is a significant correlation between the numbers of spiders caught on the wire and panel traps, but the wire traps consistently underrepresent the numbers of the lightest animals (less than 0.4 mg). Preliminary data on mass- and family-frequency distributions of Missouri aeronauts, and of ballooning mygalomorphs, are presented.

GRISWOLD, Charles E.
A REVIEW OF THE AFRICAN MICROSTIGMATIDAE (ARANEAE: MYGALOMORPHAE)
Natal Museums South Africa
The African members of the Microstigmatidae are small mygalomorphs occurring in forest or dense bush. They are found in wet leaf litter, rotten logs, or beneath stones. These bodies are usually encrusted with dirt. They have not been observed to build webs. Six species of Microstigmata are known from Africa. The characters used by Platnick and Forster (1982) to construct a cladogram for the family have been examined and found true for all six species. This cladogram is accepted and used as the basis for a group companion for Microstigmata. This genus is known only from South Africa. The distribution of Microstigmata is discussed in the context of concepts of "paleogene" and "africomane" biotas in Africa.

HEISS, John S.
A PRELIMINARY REPORT ON SPIDERS ASSOCIATED WITH RICE IN ARKANSAS
University of Arkansas
A preliminary investigation of spiders associated with rice fields in Arkansas was made to provide a foundation to evaluate spiders as predators of rice insect pests and mosquitoes. Using aquatic dip net and metal dipper, 1201 spiders specimens were collected over four seasons, resulting in 632 species. Five families and 41 species. Four new species records for Arkansas were recorded: Eresone banksi Ilve and Barrows, Eresone detiertes O.P. Cambrigo, Dysytlla israel and Zychnia rubifex Pechham and Pechham. The composition of the spider population in rice fields was broken down into three guilds based on method of prey capture: web spinners, ambushers, and hunters. The dominant guild was the hunting spiders (67.5%). The web spinners and ambushers constituted 32.1% and 0.4% of the total, respectively. The most abundant individual species of spiders were Pardosa alytina (Hentz), Eresone banksi (McCook) and Eresone detiertes (Hentz). The population of spiders in rice fields treated with carbofuran insecticide was compared with populations from untreated fields. Carbofuran seems to have little effect on spider populations in general but may decrease species diversity. The investigation suggests several avenues for future research.

HEISS, John S.
The GENUS CALYPMARIA NORTH OF MEXICO (ARANEAE: AGELINIDAE)
University of Arkansas
The genus Calypermia comprises 32 species of arachnid spiders traditionally placed in the family Agelenidae. The twenty-nine species occur west of the Rocky Mountains in the Sierra Nevada, Coast and Cascade ranges, and three species are known
from the Appalachian region of the eastern United States. In the mountainous regions of western North America *Calyptraea* inhabit cool, damp forests. Webs are placed beneath and between bark, beneath moss on rocks, and living trees, beneath large logs, along streams, and in caves. In the Appalachian region webs are placed in leaves, dirt cavities, among mossy rocks along streams, beneath overhanging rocks, beneath Rhododendron webs, and behind water falls. The web is atypical of Agelenidae, consisting of a low basket formed above and below by thick supporting lines, and a thin "platform" over the basket beneath which the spider hangs inverted. Prey capture appears typical for Agelenidae. *Calyptraea* shares the patellar fracture line with *Hillius*, *Cybaetes*, *Cybaena*, *Cybaecorus*, *Yurina*, *Eubaea*, and *Euthalia*, possible suggesting that these genera should form a group separate from traditional agelenids.

HEISS, Nancy M.

**THE SIMPLE EYE OF THE SPIDER—ANOTHER PERSPECTIVE**

University of Arkansas

The purpose of this study is to challenge the concept that all of the eyes of the spider are "simple eyes" by definition, in order to study the importance of the eyes in foraging, behavioral observations, as well as ultrastructural studies consisting of transverse serial sections and scanning electron micrographs of *Schizocosa* spp., made. By definition, an ocellus or "simple eye" serves merely to concentrate light, and no image is formed. Further investigation by various workers has shown that the principal eyes have a structure suited for image perception, and preliminary observations indicate that the wolf spider may be able to recognize stationary objects as prey from a distance of 5 cm. Studies seem to indicate that the principal eyes of the spider are not as "simple" as thought previously.

HIEBER, Craig S.

**THE AVOIDANCE OF EGG PREDATORS BY THE SPIDER NECYPONGEA LENNISCATA**

University of Florida

The short reproductive period, the rate of cocoon production, the spacing between web sites, and rate of egg development of *Necypongea lenniscata* (Araneidae) were examined as tactics to avoid egg predation by *Intraschicus nr. baseball* (Hymenoptera: Eulophidae). The life cycle of this wasp is timed to the appearance of the host, and it apparently has no trouble penetrating the cocoon to lay its eggs. However, the level of parasitism (7-8%) is constant, and relatively low when compared to the known rates for other spiders (25-75%). The major deterrent against egg predation by this wasp is the short reproductive period. The wasp introduces the number of cocoons in a string available for attack by wasps or their emerging progeny. This timing, in conjunction with a limited developmental window for parasite attack, forces the wasps off the cocoon string in search of a new host. The search for new hosts is hampered by the short length of the reproductive period, which limits the number of parasite generations, and the large number of web sites which must be searched for cocoons in the proper stage for attack. The spacing of web sites plays a limited role.

HIGGINS, Linden

**NOTES ON THE NOCTURNAL BEHAVIOR OF NEPHILA CLAVIPES (LINNEAUS) IN TEXAS**

University of Texas

The activity of *Nephila clavipes* was surveyed at half-hour or hourly intervals for two nights in July, 1962, in Brazoria County, Texas. The primary difference between nocturnal activity (272 spider-hours) and diurnal activity (223 spider-hours) was that web construction and web utilization occurred at night. The rate of prey capture (insects per spider per hour) was much greater in the nocturnal observations. Records were also made of the type of prey captured, some family identifications were possible. Courtship and copulation was also observed during nocturnal surveys. Web removal behavior preparatory to respinning strongly resembles web removal by males in courtship of some araneids and linyphiids; and the orb removal done by the females in response to rainfall. Some alterations in the barrier webs and frames are made at this time, and respinning is initiated at once. During web removal, predatory behavior continued until the orb was gone or web building behavior started.

HODIE, Maggie

**TERRITORIAL BEHAVIOR AND RELATED RESOURCE ASSESSMENT STRATEGIES IN FEMALE BOWL AND DOILY SPIDERS, FRONTINELLA PYRAMITELLA (LINYPHIIDAE).**

University of Georgia

Field experiments were conducted to determine if territorial behavior is involved in maintenance of regular spacing patterns in bowl and doily spiders. Stereotypic behavioral displays were observed in induced encounters between mature and adult females at natural web sites. Spider weight, web ownership status and web volume were examined as possible assessment parameters. Influencing the intensity and/or outcome of the interactions.

KRONESTEDT, T., C. D. DONDALE, and B. N. Anne HUDSON

**DISTINGUISHING BETWEEN TWO CLOSELY RELATED SPECIES OF PARDOSA (ARANCEAE: LYCOSIDAE) BY ELECTROPHORESIS AND MALE COURTSHIP BEHAVIOR.**

Naturhistoriska Riksmuseet, Stockholm

Pardosa fuscula (Thorell) of North America and P. atrata (Thorell) of Eurasia, traditionally distinguished only by geographic origin, are shown to differ as well in electrophoretic and male courtship characters. It is concluded that the two forms should be treated as a closely related but allopatric species-pair rather than a single Holarctic species.

LEVY, Herbert W.

**THE SPIDER GENUS MICROTHENA**

Harvard University

There are 104 species of *Microthea* in the Neotropical region, of which 29 species are new. In Central America there are 34 species, equal to the number in the Amazon region. While species in one area are usually easily separated, many species are widespread with geographical variation. Some may hybridize.

Adult females may have fewer or more spines than immature males; lack spines on the abdomen. It is not known in which instar sexes differentiate. All species hang in an unusual position in the web. They do not attack-warp. Most species stridulate when disturbed. Perhaps the spination makes it difficult for predators to form a search image.

MAHLER, Anne E.

**THERMOREGULATORY POSTURING IN A POPULATION OF ARGIOPE ARGENTATA**

University of Miami

Graded behavioral thermoregulatory posturing was observed in a population of tropical orb-weaving *Argiope argentata* in a clearing on Barro Colorado Island, Panama. Body orientation of 25 individuals was measured hourly throughout 9 days in Sept. and Oct. Hourly angles of the spiders' longitudinal and horizontal axes to vertical were calculated and compared to angles of incident sunlight calculated for that location and time. Spiders on western surfaces of webs showed large angles early in the day and then a gradual decrease. Angles of elevation of spiders on eastern surfaces were negative in early morning and then gradually increased in size. The angles between the longitudinal spider axis and incident sunlight decreased toward mid-day and were less than 30° throughout the day.

MEISTER, J. S. and W. H. WHITCOMB

**LIFE HISTORY OF CORVITHALIA PANOSA (MALAC.).** (ARANCEAE: SALICIDAE)

University of Florida

Field collected Corvithalia panosa in late instar stages were reared to maturity in the laboratory. Newly mature spiders were allowed to mate and their progeny were reared to maturity, mated, and maintained to death. Approximately 30 days elapsed between copulation and the first oviposition. An average of 24 days separated each successive oviposition. Eggs required 7-11 days from oviposition to reach the 1st post embryo or rupture of the chorion. Duration of the 2nd
post embryo, from the rupture of the vitelline membrane to the first molt, required 10–11 days. Males matured earlier, passed through fewer molts, reached smaller adult size, and had lesser adult longevity than females. Males typically reached maturity in the sixth instar (approximately 127 days from oviposition); females required seven instars (151 days). Spiders reached maturity all months of the year in the lab. At least three instar measurements of carapace width were made for each individual. Instar growth was observed but was not statistically significant. Carapace width of lab-reared adult males averaged 1.53 mm and 1.69 mm for females. Fifty-six females reared and mated in the lab produced a total of 180 egg sacs containing 941 eggs. Each egg sac averaged 5.18 eggs. Each female laid an average of 4.17 egg sacs containing an average of 17.43 viable eggs in her reproductive life. Observations were made on courtship, copulation, sperm induction, ecydysis, oviposition, brood care, egg eclosion, early development, and feeding.

OPELL, Brent D.

FORCE EXERTED BY ORB-WEB AND TRIANGLE-WEBS SPIDERS OF THE FAMILY ULOBORIDAE
Virginia Polytechnic Institute

In the family Uloboridae, web reduction is accompanied by a reduction of anterior eyes, by positional shifts in posterior eyes, and by the appearance of posterior lateral eye tubercles. The purpose of this study was to determine the visual implication of these changes by comparing the optical properties of the orb-weaver Octonoba potomadina and the single-line-weaver Micranomopus sp. This was done by determining the visual angles of each eye from optical and physical measurements and plotting these angles on carapace diagrams. Despite loss of the anterior eye row, Micranomopus retains visual coverage comparable to that of the posterior eye row of Octonoba and the posterior lateral eyes of Micranomopus. The effect of these changes is to give the posterior median eyes of Micranomopus visual coverage comparable to that of the posterior eye row of Octonoba and the posterior lateral eyes of Micranomopus. This relationship holds when either first femur length or body weight is used as an index of size.

OPELL, Brent D. and Paula F. CUSHING

VISUAL FIELD OF ORB-WEBS SINGLE-LINE-WEBS SPIDERS OF THE FAMILY ULOBORIDAE
Virginia Polytechnic Institute

A simple trap design utilizing a single fine steel wire coated with Tac-Trap is described. Such traps were used during 1983 and 1984 to monitor ballooning spiders over several cornfields in conjunction with weekly surveys of spiders in those fields. Results showed that with few exceptions, all species common in the cornfield were also taken on the sticky wire traps. However, not all species collected on the traps became established in the cornfields. Common cornfield spiders are a subset of aerially dispersing spiders that possess habitat requirements matched by a field corn monoculture.

RAPP, William F.

SOME OBSERVATIONS ON THE BIOLOGY OF TIBELLUS OBLONUS (ARANEAE: PHILODROMIDAE)
Crete, Nebraska

Tibellus oblonus (Walckenaer) is distributed throughout the Holarctic Realm. Its specific ecological niche is the grass and herbaceous vegetation at the edges of ponds, lakes, and rivers. It would appear that the species needs a habitat which has a fairly high moisture. This study is based upon the study of 142 specimens mainly collected in the Grassland biome of North America. The principal objective of this study was to determine how this species overwinters and when sexual maturity was reached. Of the specimens studied, 89 or 62.7% were immature and 33 or 23.3% were adults. Of the mature specimens, 10 or 18.9% were males; 43 or 61.1% were females. Adult females were collected from May through September, while the highest numbers were from July 3 to August 23. Males were present from June 1 until August 23. Immatures were taken as early as May 15 and as late as October 15. There was no period when immatures could not be found.

Mikulski's 1962 and 1963 study of this species on the Polish Baltic coast found that in early spring and late autumn all specimens were mature. Large numbers of immatures were taken in May and June. Based upon my study and Mikulski's, it appears that this species overwinters as an immature.

REISKIND, Jonathan

A FOSSIL LYSSOMANES IN THE ANTIILLAINS GROUP (ARANEAE: PHILODROMIDAE)
University of Florida

A male Lysomanes, well preserved in Dominican amber (OLigocene), is described and compared to the two members of the Antillians group: L. antillanus Peckham & Wheeler and L. portoricensis Petrunkevitch. While clearly a member of this group it is a distinct species exhibiting traits of both its closest relatives. The relatively minor morphological changes in this "advanced" group over the last 30 million years is discussed.

RICHMAN, David B.

PRELIMINARY STUDIES ON THE GENUS HENTZIA MARX 1863 (ARANEAE: SALTICIDAE)
New Mexico State University

The genus Hentzia ranges from southern Ontario to northern South America and from the Lesser Antilles to Sonora. The genus contains nearly 20 species, including several apparently undescribed species from the Bahamas and the Caribbean. One described species, Hentzia nova Chamberling from Peru, does not belong in the genus.

ROLAND, Chantal, Alain PASCUET, Raymond LEBORGNE, and Bertrand KRAFFT

INTERACTION BETWEEN FEMALES OF ZYGIELLA X-NOTATA: INFLUENCE OF A SILKY SUBSTRATE
Université de Nancy
On windows of our University, Zygella x-notata shows an aggregated type of distribution. The environmental factors, i.e., climatic, physical factors, potential prey, don't seem sufficient to explain this aggregation. Therefore these clumping could depend partly on interactions between individuals.

According to the important role of silk structures in spiders, we tested their influence in interactions by using a T-maze technique. Previously this one allowed us to study the sexual and social attraction mechanisms in several species. These results show that silks substrates can play a role in interactions between individuals, which could influence the conspecific placement and activity.

ROWNER, Jermone S.
SPIDER NESTS MAINTAIN A PHYSICAL GILL: FLOODING AND THE EVOLUTIONARY ORIGIN OF SILK
Ohio University

I examined resistance to drowning in two spiders that build nests beneath stones. Submerged 10 cm in aerated water at 20-24°C, Atraphosa bicolor and Dysdera crocata (various instars) gradually lost their air film and drowned within 15-30 seconds. However, if allowed to remain in their nests, A. bicolor survived up to 7 days and D. crocata up to 10 days. These were not upper limits, but reflected the spiders' "decision" to eventually leave the safety of the nest. Submerged nest-dwellers did not enter a diapaus-like state but showed occasional activity; and they moved rapidly when I opened the nest after it was underwater for days. Following an initial decrease, the volume of the entrapped bubble remained constant. Thus, silk provides a mechanical structure that prevents the Ege effect from reducing the physical gill - ensures continued uptake of oxygen from the water.

Such use of silk to survive rain-caused flooding leads me to speculate: Just after the transition from an aquatic to a terrestrial form, the spider's ancestor may have dwelt in burrows along shores, a frequently flooded habitat. The evolutionary precursor of silk may have had the adaptive value of providing a means of maintaining a kind of plastron, enabling the animal to respire under water during floods.

SCHLINGER, Evert I.
STUDIES ON THE HOST-PARASITOID RELATIONSHIPS OF THE MYGALOMORPHAE AND THEIR INTERNAL DIPTEROUS PARASITIDS, THE AGROERIDEA
University of California, Berkeley

During the past thirty years the author has been fortunate to have studied and reared spiders and their parasitoids from many parts of the world, especially North America, Central America, South America, New Zealand and Australia. This discussion summarizes the above relationships, selected biological facts, and certain rearing and distributional problems encountered during these studies.

STIEVENROTH, Cheryl and Norman HÖRNER
THE JUMPING SPIDERS (SALTICIDAE) OF THE VIRGINIA PENINSULA
Midwestern State University

Thirty-one species representing 18 genera of Salticidae are recorded from the Virginia Peninsula. Habitat and natural history information for each species is presented. Habitat distributions for salticids on the Peninsula show an obvious diversity for some species while others appear to confine themselves to restricted environments. The most abundant salticid collected was Hentzia palmarum (Henz). Metaphidippus galatha (Walckenaer) and Metacabra undata (DeGeer) were the most widely distributed species. Salticids reported for the first time in Virginia by this study are Lasconemobius gregalis (Walckenaer), Plathypopus obscurum (Peckham), P. hoplites (Peckham), P. calopus (Peckham), Thalina sylvana (Henz), Stitticus fasciger (Simon) and Zygoballus sexpunctatus (Henz).

STUTER, R. G. RENKES, and A. HIRSCHMEIER
CHEMICAL COMMUNICATION IN BOWL AND DOILY SPIDERS, FRONTINELLA PYRAMITELLA (LINYPHIIDAE)
Vassar College

Bowl and doily spiders communicate with each other primarily by stridulatory (vibrational) and chemical signals. Chemical signals borne on the silk are sex-specific and serve several identifiable functions: female-produced chemicals on whole webs elicit gravity oriented search behavior and courtship when perceived by males; draglines bearing the same chemicals also elicit courtship behaviors but are not followed by males; male-produced chemicals identify F. pyramitella webs to both sexes. Chemicals borne on the female cuticle identify the female to courting males in the absence of vibrational cues to the female's identity. Apparently the bowl spiders is rich in chemicals, of which not one has been identified, and of which many are probably yet to be discovered.

THOMS, E. M.
SOUND PRODUCTION BY THERAPHOSA LEBLONDII (ARANEAE: THERAPHOSIDAE)
Virginia Polytechnic Institute

The morphological, behavioral, and acoustical characteristics of sound production by Theraphosa Leblondii were investigated. When disturbed, T. Leblondii raise the pedipalps and legs I and move these appendages against one another to produce a hissing-like sound. Modified (stridulatory) setae are opposing surfaces of the femur, trochanter, and coxa of the pedipalps and legs I and on opposing coxal surfaces of legs II. Adult males, females, and nymphs (beginning at instar 5) possess stridulatory setae. I. leblondii can not produce chemical webs for these setae are removed. Scanning electron microscopy reveals unusual modifications of the stridulatory setae including long, filamentous projections on the central 65% of the shaft and modification of the terminal 15% of the shaft into a file and scraper. The terminal file and scraper tanders emit a sound wave and has a longitudinal row of short, tooth-like projections with cupped tips.

TIETJEK, W. J. and L. R. AYYAGARI
COMMUNICATIONS ASSOCIATED WITH THE WEB OF THE SOCIAL SPIDER MALLOS GREGALIS (ARANEAE; DICTINYIDAE), THE ROLE IN PREY ATTRACTION
Lindenwood College

Unlike most social spiders, Mallos gregalis do not clean the webs they build but rather incorporate the remains directly into the nest matrix. The presence of prey remains in the web affect the microbial populations associated with the nest. Under laboratory and field conditions, webs have a characteristic heavy-sweet odor. Behavioral tests indicate that the primary prey species M. gregalis (muscid flies) is attracted to the sweet-smelling web. Examination of the web and debris associated with the web indicate that two species of yeast are responsible for the odor of the nest and that the microflora develop within the carcasses of the fed-upon flies. Flies not fed upon by M. gregalis have a rancid odor when cultured in nutrient media. Two-choice experiments indicate that flies are attracted to yeast cultures. Culture techniques which select for yeasts at the expense of other microorganisms suggest that the yeasts are part of normal flora of the flies, and that the process of feeding by M. gregalis affects the final species composition of microflora such that the yeasts out-compete bacterial species.

VALERO, Carlos E.
MYGALOMORPH SPIDERS IN THE BRYCHIDELAE AND PARAPRIOBASE (ARANEAE) FROM COSTA RICA
Universidad de Costa Rica

The following species are described: Psaisistops verapendens (Brychidela), Paratropis janthanis, Anisaecus argus and A. maculatum (Paratropidae).

The brychidela, from the northern plains, is the first record for the family in Central America. F. janthanis and A. maculatum inhabit the Central Valley, and F. argus is from the Atlantic slopes. The specimen identified by Reinemer (1940) as Anisaecus specrabilis is an immature female of Paratropis sp.

Types are deposited in the Museo de Zoologia, Universidad de Costa Rica.
VIJAYALAKSHMI, K. and S. SIVARAMAN  
PREDA TORY POTENTIALITY OF THE SPARRASSID SPIDER HETEROPODA 
VENATORIA - A LABORATORY BIOCONTROL ESTIMATE  
Loyola College, Madras, India

The giant crab spider Heteropoda venatoria is a recognized predator of household insect pests. Their flattened body enables them to fit into cracks and crevices, in particular the habitat of prey cockroaches. Their attack gesture and strength enhances their predator efficiency on the active prey cockroaches.

The functional response trials with varied prey types and size classes indicate their deviation from the typical type II response of Holling (1949) with reference to attack rate (a) and handling time (T_h). This may be attributed to the probable prey size class selection and palatability. Besides, the data show maxima and minima with reference to the selection and handling of varied types and size classes of prey.

The optimal allocation of predator searching effort increases the overall rate of predator encounter.

The variation of subcomponents of a and T_h, influence of prey densities, types and size classes are statistically correlated. It has been suggested that the variation in T_h might be due to the prey encounter either killed or feed.

Spiders, the giant crab spider H. venatoria showed their clumped distribution under natural conditions suggesting their clumped distribution due to behavioral interactions among neighbors, however, the mechanisms responsible for the observed distribution were not determined.

WHEELER, G. S., J. P. McCAFFREY AND J. B. JOHNSON  
PRELIMINARY AND FIELD STUDIES OF THE BIOLOGY OF DICTYNA 
COLORADENSI S CHAMBERLIN AND D. MAJOR MENGES IN IDAHO  
University of Idaho

D. coloradensis and D. major are potentially important predators of insects imported and released for the biological control of weeds in Idaho. As such, they may be antagonists to these biological control efforts.

Laboratory and field studies were undertaken to provide basic biological information necessary for evaluating impact of these spiders on the biological control of weed programs. Of particular interest were laboratory rearing to determine the number and duration of instars and studies of the spiders in the field to evaluate spatial and temporal aspects of the spider/prey relationships.

A preliminary study indicated that on the average, D. coloradensis required more molts and a longer duration in time to reach maturity than did D. major.

Field studies conducted in spotted knapweed infested sites showed that these spiders are sympatric, but it appears that adult D. coloradensis is a poor competitor with respect to time of D. major. Also preliminary studies indicate that D. coloradensis constructs its web higher in the plant canopy than D. major.

WILSON, Graeme  
COLOR VISION IN SALTICIDAE  
University of Alabama, Birmingham

The literature strongly suggests that jumping spiders use their anterior median eyes to make color discriminations. This conclusion is reached from behavioral and electrophysiological studies. Yet one important experiment is still missing. It remains to be demonstrated that color discrimination is possible when the brightness of two colors is equal. To do this requires knowledge of the relative brightness of different colors when viewed by the salticid's anterior median eyes.

One experimental method of addressing the problem is suggested. It requires training spiders to run a maze. The experimental spider, D. coloradensis, shows that the method is inexpensive in materials, but places extreme time demands on the experimenter.

WISE, Davis and Paul REILLO  
FREQUENCIES OF COLOR MORPHS IN SOME ENOPLOGATHA OVATA 
PUBLICATIONS IN THE EASTERN UNITED STATES  
University of Maryland, Baltimore County

The theridid genus Enoplognatha ovata exhibits a conspicuous color polymorphism characterized by three morphs: lineata (yellow abdomen), redimita (two red stripes) and ovata (solid red band). European researchers have found that local populations often differ substantially in morph frequencies, and that range of frequencies varies with geographic regions. We found evidence of similar variability in North American populations of E. ovata. We recorded the phenotype of 1107 spiders from several local populations, 60 to several km apart, in each of four areas: Mt. Desert Island, Maine; Cape Cod, Massachusetts; eastern New York; and central New York. In Maine, the most intensively sampled region, the frequency in local populations of the yellow form, lineata, ranged from .70 to .90. The overall frequency of lineata was .70 in Massachusetts and close to .80 in the other three regions. The most striking geographic differences in frequency were of the solid red morph, ovata. This form was absent from all New York populations sampled, but occurred in all but two local populations in Massachusetts and Maine. Overall frequencies of ovata in the Massachusetts and Maine samples were .05 and .08, respectively. Frequencies of ovata in the local populations in these two areas ranged from .05 to .15.

WEGER, Wendy and W. J. TIETJEN  
A PRELIMINARY STUDY OF THE BEHAVIORAL ECOLOGY OF SPATIAL 
DISTISTRIBUTION IN THE BOWLING DOOY SPIDER FRONTINELLA 
PYRAMIDII  
Lindenwood College

Most spiders are solitary and show random or dispersed distributions. However, Frontinella pyramidii exhibits a clumped distribution under natural conditions suggesting either an interaction among animals or between the animals and features of the habitat. Field studies indicate that temperature, light, prey availability, and hedge and other environmental features were of little significance in explaining the observed distribution. Field data concerning website selection vs. substrate complexity are backed by laboratory studies. Both field observations and laboratory studies indicate that E. pyramidii are tolerant of other members of their species and may occupy the same web. It is suggested that E. pyramidii exhibit their clumped distribution due to behavioral interactions among neighbors, however, the mechanisms responsible for the observed distribution were not determined.

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Linden Higgins has provided the following key to arachnologists attending the 1984 New Orleans meeting. If there are any corrections or additions please send them to B. Opell and they will appear in the next newsletter.