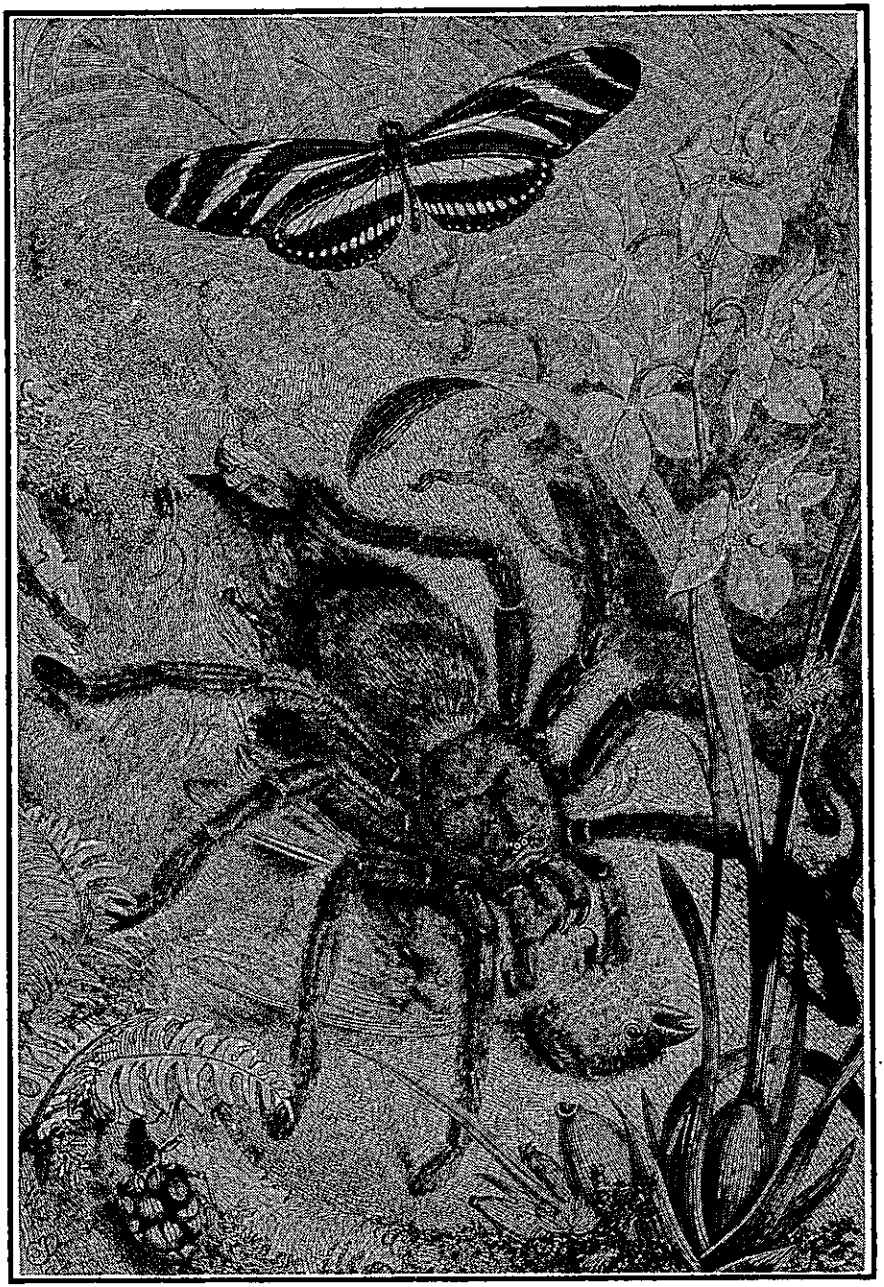
American Arachnology

The Newsletter of the American Arachnological Society



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In this issue of AMERICAN ARACHNOLOGY:

AMERICAN ARACHNOLOGY is the newsletter of the American Arachnological Society and is sent only to society members. For information on membership, write Dr. Norman Platnick, Membership Secretary, American Arachnological Society, Department of Entomology, The American Museum of Natural History, New York, NY 10024, USA. Members of the Society also receive the JOURNAL OF ARACHNOLOGY three times a year.

Correspondence, submissions and requests for back issues of AMERICAN ARACHNOLOGY should be directed to the editor, William A. Shear, Biology Department, Hampden-Sydney College, Hampden-Sydney, VA 23943, USA.

Notice of a change of address should be sent only to the Membership Secretary (see above). To do otherwise merely delays the change; all mailing for the Society is done from a list maintained by the Membership Secretary.

REPORT ON THE EIGHTH INTERNATIONAL CONGRESS

At our request, NORM PLATNICK sent in the following report on the 8th International Congress of Arachnology:

The 8th International Congress of Arachnology was held at the Universität für Bodenkultur, Vienna, from July 7-12, 1980. After the death of our original host, Dr. HARALD NEMENZ, in 1979, a committee of Austrian arachnologists (assisted by Frau Nemenz and staff members of the Universität) stepped in to tackle the task of organizing a meeting for about 150 people. The turnout was splendid (especially considering the high cost of travelling), with representatives from such far-flung locales as Australia (VAL DAVIES), New Zealand (RAY and LYNN FORSTER), Argentina (MARIA GALIANO and EMILIO MAURY), and South Africa (BRUNO LAMORAL). Once again, the large number of papers to be presented required concurrent sessions, but because the organizers required manuscripts to be submitted in advance and had the Proceedings volume (edited by JÜRGEN GRUBER) printed and ready for distribution on the first day of meetings, it was possible to at least know exactly what one was missing!

Highlights of the formal presentations included five Congress lectures, on the evolution of spider tarsal organs, respiratory systems, and female genitalia (R. R. FORSTER), the ecology and behavior of tropical spiders (M. H. ROBINSON), spider communication systems (B. KRAFFT), the cladistics of chelicerates (P. WEYGOLDT), and the zoogeography of Alpine spiders (K. THALER), as well as a day-long symposium on arachnid zoogeography organized by J. PRÓSZYŃSKI. Highlights on the informal side were a day's excursion by bus for spider collecting and general conversation, with different busloads heading in different directions but meeting for an evening at a wine cellar sampling the results of the vineyards blanketing the local countryside. One jovial session was devoted to an evening of films on arachnids, and another to the general meeting of CIDA, where H. W. LEVI was elected to succeed P. TONGIORGI as President, the inevitable dues increase was approved, and after lengthy discussion of alternate sites offered for the 9th Congress (including Turku, Finland; Istanbul, Turkey; and Gainesville, Florida) it was decided to accept the gracious (and/or foolhardy!) invitation of MIKE and BARBARA ROBINSON to join them in Panama in 1983 for the first Congress to be held outside of Europe. Let's hope that all AAS members will help the Robinsons to make it a memorable one.

ROTH TO OFFER PRIZE

VINCE ROTH of the Southwestern Research Station, Portal, Arizona, has let us know that he will offer a hardbound copy of PIERRE BONNET's "Bibliographia Araneorum, Tome I" as a prize for the best paper on spiders given at the 1981 meeting in Knoxville by a beginning student. The award will be decided by a panel of three judges selected at the meeting by the President of the Society, or his representative. This is a real incentive, since Bonnet's book is absolutely vital to any researcher in araneology. Get working, students! And be sure to fill out and send in the registration form bound in this newsletter at your earliest convenience.

ARACHNOQUIZ # 5

The following ARACHNOQUIZ is based on generally known information about arachnid behavior:

1. In what spider family to males frequently "tie down" females for mating?

2. In what order of Arachnida does the "hand-shaking ceremony" occur when individuals meet?

3. What unusual feature of parental care is to be found in the spider family Pisauridae?

4. What is the role of the peculiar hooked setae found on the abdomens of female wolf spiders?

5. How does Dinopis make its rectangular web?

6. How does the Bolas Spider capture prey?

7. What arachnid orders produce spermatophores? Do any orders of arachnid have direct apposition of the male and female genital pores?

8. Name the arachnid genus in which the male produces a secretion on which females feed during mating.

9. Where is the sperm transfer organ of the Solpugida located?

10. "Trap-door" spiders are known from several spider families. Name those found in North America.

Last time's ARACHNOQUIZ was won by JOHN KOCHALKA of the University of Florida, whose answers are printed below. We disagree with John's answer to Question 3. Ochyroceratidae is the answer we had in mind.

1. Hypochilus builds a lampshade with the small end attached to a rock.

2. Micrathena holds the 3rd leg forward when sitting in the web. When the spider dies in alcohol, the 3rd leg could be held in any position.

3. Telemidae.

4. Lycosa howarthi Gertsch, with vestigal eyes, and Adelocosa anops Gertsch, with no eyes whatsoever, are both from caves in Hawaii. The other blind lycosids, with vestigal eyes, are Sosilaus spiniger Simon from the burrows of pocket gophers (Geomys) in Florida. Sosilaus spiniger usually, or at least sometimes, have normal eyes. Sosilaus is perhaps a synonym of Pirata.

5. The adult male of Hexurella encina Gertsch and Platnick (Mecicobothriidae), at 2.25 mm is probably the smallest mygalomorph. Members of the Microstigmatidae ("traditionally" placed in the Dipluridae) such as Pseudonemesia Caporiacco (which Caporiacco placed in its own subfamily in the Ctenizidae) are about as small, and some of these microstigmatids might be even smaller than Hexurella. Microstigmatidae are known from Colombia, Venezuela, Brazil, and southern Africa. Norm Platnick and Robert Raven are revising the Microstigmatidae, and the only reason that I know all this is because I collected some Pseudonemesia in Colombia. Some Pycnothelidae are very small (and some are rather large), but I don't think that any of them are as small as the above-mentioned spiders.

6. Uloboridae.

7. Salticidae, which occupy 23 mm of space in Roewer's Katalog der Araneae. Araneidae and Tetragnathidae together occupy only 12 mm, Linyphiidae (with Erigonidae) occupy 9.5 mm, and the Theridiidae only 6 mm. This is truly amazing because, if the Salticidae have evolved as recently as I think they have (many of the Oligocene forms are primitive), then they should all be in the same genus, by the standards that are applied to most other spiders.

8. Patu digua Forster & Platnick, male 0.37 mm, in the Symphytognathidae.

9. Thiodina (Salticidae), Misumenops (Thomisidae), and Oxyopes (Oxyopidae). (Devin Carroll, 1977; Peckhamia Vol. 1, no. 2, p. 30).

10. I think Dictyna wins with 133 species in North America in 1968. Theridion is a close runner-up with 69 species north of Mexico in 1975. Araneus has a mere 49 species north of Mexico.

RESEARCH NEEDS

MARK HOMONOFF of the Rockefeller University, New York, NY, needs live Latrodectus:

> "Neurobiologists seek supply of Latrodectus mactans. We want a large quantity, and are able to pay the supplier. Please write or phone Patricia Wade, Rockefeller University, 1230 York Avenue, New York, NY 10021 or telephone 212-360-1448 (work) or 212-755-6746 (home)."

The Proceedings of the 8th International Congress of Arachnology, held this past summer in Vienna, have already been published by Verlag Egermann, A-1170 Wien, Hernalser Hauptstrasse 196, AUSTRIA. The price is about $40.00.

Available for $5.50 from the Ohio Biological Survey, 484 W. 12th Avenue, Columbus, Ohio 43210, USA, is "Jumping Spiders in the Cincinnati Region of Ohio, including Butler, Clermont, Hamilton and Warren Counties" by CHARLES M. OEHLER. The paper-bound publication is 36 pages long and is illustrated by the same Emerton drawings used in KASTON's "Spiders of Connecticut." No new species are described.

Newly published and of possible interest to arachnologists is RICHARD L. HOFFMAN's "Classification of the Diplopoda." This marvelously complete volume of 237 pages outlines and discusses a new classification for the millipeds, with numerous taxonomic innovations. Together with JEEKEL's "Nomenclator Generum et Familium Diplopodarum," Hoffman's book will allow for the first time easy entry into the literary maze of diplopodology. The book is published by, and is available from, Secretariat du Muséum d'Histoire naturelle, Case postale 284, CH1211 Genève 6, SWITZERLAND. A longer review of this book will appear in a forthcoming JOURNAL OF ARACHNOLOGY.

MORE ON ARANEISM

FRANK ENNIK, of the Vector Biology and Control Section of the California Department of Health, had some interesting things to say about araneism in California:

"In my 14 years with the Vector Biology and Control Section, California Department of Health Services, I have provided identification of specimens and consultation to local health agencies, physicians, and the public on real and suspected spider bites. My main interest was the incidence of bites (real and imagined) and the distribution of Loxosceles spiders in California and southwestern U. S. Much has been learned about Loxosceles spiders in the southwest but I also had an opportunity to become familiar with other spider species that affect human health."

"Submitted spiders collected outside the home were tallied separate from spiders collected inside the home. For the most part, the latter group included a lesser number of genera and species compared with the spider fauna found outside. In addition, the stage, number, and species found inside houses seemed to be seasonal and would probably coincide with the outdoor fauna. Penultimate or adult males are often encountered. A third group are submitted specimens involved in bona fide bite cases from all sources and regions of the State. Patient data was collected when available. I had expected to submit these observations for publication when enough material has been collected. But how much is enough? My records for California show the usual array of families involved in bite cases: Theridiidae, Clubionidae, Gnaphosidae, Lycosidae, Scytodidae, Salticidae, Amaurobiidae, and Dipluridae."

"In California the distribution of endemic Loxosceles spp. is limited and confined for the most part, to specific habitats in the southern half of the State. Bite cases attributed to these spiders have been identified there. However, some physicians in the northern half of the State have, on occasion, assigned necrosis cases to the Loxosceles spiders based solely on clinical observation."

"I cannot comment upon the clinical observations of the physician but from an araneological view, I tend to discount such reports in northern California without substantial epidemiological evidence. Instead, I suggest to the physicians to consider other arthropods as the cause of illness and I provide examples. Once the physician assigns an arthropod name as a cause of discomfort or illness, it is often difficult to get the physician to change the name even though there is evidence to the contrary."

B. J. KASTON also sent in a recent article of his published in CALIFORNIA VECTOR VIEWS, Vol. 25 (7/8):25-27. Exclusive of the bibliography and abstract, we reprint it below:

"It is now well-known that, for the United States at least, the most serious effects result from the bites of the black widow, Latrodectus spp., and the brown recluse (or violin spider), Loxosceles reclusa and its congeners. In southern California, in addition to cases of latrodectism and loxoscelism, there have been reports over the past dozen years or so, of cases of araneism where other spiders are involved. And these have averaged about one report per year, although undoubtedly many cases go unreported. The victim may not report the bite, or the physician may not, or the spider is merely discarded and hence is not available for later identification."

"Over the past few years I have been called, on a number of occasions, by the staff at the San Diego Museum of Natural History, at the Poison Center of the University Hospital, and at the San Diego Zoo. For most of these instances the spider had not been saved, but I can report the following three instances which have come to my attention where the spider was saved. On 24 May 1978 a 17-year-old female was bitten on the arm while taking a nap. She was awakened by the bite and brushed the spider off to the floor but luckily had enough presence of mind to collect the specimen. I identified it to be a female Herpyllus blackwalli (which is also known as Scotophaeus blackwalli), a ground spider of the family Gnaphosidae. A necrotic lesion developed almost immediately. There was pain, which continued for four or five days, during which time the axillary lymph nodes were swollen and tender. By the fifth day the pain lessened and the patient reported no further symptoms."

"On 7 May 1968 the Natural History Museum had a report from a woman who was bitten on the hand while she was working with plants in her yard. The specimen was brought in, and was identified as a female Phidippus johnsoni (the jumping spider long known under the name formosus). The slight pain the woman experienced lasted only a few minutes."

"On 24 January 1972 a male outpatient brought into the U. S. Naval Hospital a spider which I later determined to be a female Araneus gemma. It had apparently bitten him as he brushed against it in its retreat among the leaves and branches of a bush. He indicated that the pain was only slight and had subsided after a few minutes."

"Schmidt (1973) in a discussion of araneism in Europe considered that most cases stem from bites of tropical spiders, either while the victims were touring, or else from the exotic spiders that had been accidentally imported. However, others have reported cases involving also native European spiders. These include: Agelena labyrinthica by Bonnet (1967); Dysdera sp., Herpyllus blackwalli, and the linyphiid Leptorhoptrum robustum by Duffey and Green (1975); Coelotes obesus, Argyroneta aquatica, Segestria florentina, Argiope lobata, Araneus diadematus, and Steatoda Paykulliana by Maretić (1975); and Araneus sexpunctata by Maretić and Milina (1976). In addition, from Japan Ori (1975) reported Chiracanthium japonicum."

"Recent reports of envenomation in California mention bites by Chiracanthium inclusum, Neoscona oaxacensis (i.e., vertebrata), and Misumenoides aleatorius (Waldron 1965); by Phidippus johnsoni (Russell 1970); by Argiope aurantia, Liocranoides sp., and Steatoda grossa (Russell et al. 1972); and by Peucetia viridans (Hall and Madon 1973). Elsewhere in the United States the literature indicates envenomization by Lycosa miami (Grothaus and Teller 1968); by Herpyllus ecclesiasticus (Oehler 1974, Majeski and Durst 1975); by Argiope aurantia and Chiracanthium inclusum (Gorham and Rheney 1968); by Chiracanthium mildei (Spielman and Levi 1970); by Trachelas volutus (Pase and Jennings 1978); and by T. tranquillus (Oehler 1971, Uetz 1973)."

"Many of the above named species are virtually always found outdoors, and they may be stimulated to bite when a human brushes up against the web, or against the foliage on which the spider is resting. However, a number of these species are commonly encountered indoors, and for California these include Chiracanthium inclusum, Herpyllus blackwalli, and Steatoda grossa. In addition, I have many times had brought to me from inside dwellings, and have myself often collected, Trachelas pacificus, which is one of our most common synanthropic spiders. It would not be unexpected for some Californian to experience an accident with this species, as has been reported for its congeners, particularly the eastern tranquillus.

"Fortunately these instances reported above were not attended by symptoms as serious as those of latrodectism and loxoscelism, but nevertheless we should be aware of the possibility. The extension of our knowledge of araneism can be enhanced whenever identifiable specimens are brought to our attention."

NEWS OF THE SOCIETY

HERB LEVI writes as follows:

"Article 1, Section 3 of the By-laws has to be changed. Delete most of the Article and leave only Section 3: 'Dues shall be paid upon receipt of an annual bill.' This will jibe with By-laws Article 4, dues; at present the By-laws are in conflict."

Membership Secretary NORM PLATNICK has provided this report:

"As of September 1, 1980, both membership in the American Arachnological Society and circulation of the Journal of Arachnology were at all time highs. Records from the early years of the society are too fragmentary to allow comparable figures to be derived, but recent totals are as follows:

Year	JOA Volume	Members	Subscribers	Circulation
1975	3	337	81	418
1976	4	303	56	359
1977	5	310	33	343
1978	6	338	65	403
1979	7	396	89	485
1980	8	403	93	492

The 1980 figures will probably show a slight increase before JOA 8(3) appears and dues are no longer accepted for the year (after the third issue of a year is mailed, late dues are not accepted and journal issues must be purchased at back issue prices). Both membership and circulation fell steeply in 1976 and 1977, and congratulations are due to the JOA editorial staff (and especially to Dr. OSCAR F. FRANCKE) for their magnificent efforts in getting the journal back on schedule and thereby recouping our lost subscribers."

"Members should note that the services they receive bear a direct relationship to the speed with which they respond to the annual dues notices. Persons who pay late may miss issues of the newsletter (which are mailed only to members in good standing on their date of issue) and may experience delays in receiving foreign publications purchased through the society. Only one final warning is mailed to those who fail to respond to the initial billing."

BIOGRAPHICAL SKETCH: FATHER CHRYSANTHUS

The following biographical sketch of FATHER CHRYSANTHUS O.F.M. Cap. was written by PETER VAN HELSDINGEN, and is reprinted from Bull. Brit. Arachn. Soc. (1973) 2 (7):148.

At the age of 66, Father Chrysanthus died at his "home", the monastery of the Capuchin Order at Oosterhout, Netherlands. He had been ill for several months and had undergone an operation, which unfortunately did not eliminate the cause of his illness. Most of his colleagues remained unaware of what he had to go through. With his modest and self-effacing personality he persevered in the task he had set himself, up to the very end. His gentle manner and quiet politeness, which made him such an attentive listener, will be greatly missed by all.

Born in 1905 at Mill, in the province of Noord-Brabant, he was sent to the minor seminary of his order and was ordained in 1924, after having finished his studies in philosophy and theology at the major seminary. For forty years he served his order by teaching biology at the minor seminary. The moment of retirement was nearing quickly, and he was full of plans for the long days ahead, when he could devote all his time to spiders.

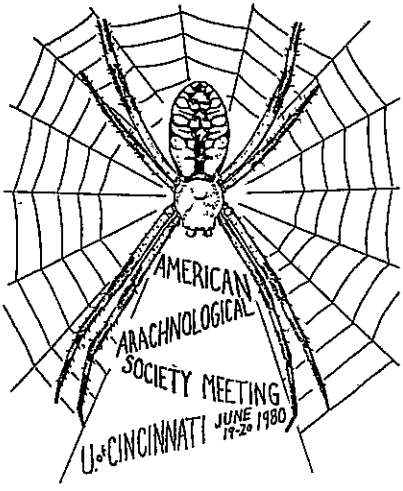
His career as an arachnologist began as a scientific lecturer to the general public, both through the spoken and the written word. It revealed his remarkable capabilities as a teacher. His main interests at that time were the faunistic research of the Netherlands and behaviour of spiders in general. He did not shrink from specific problems, and demonstrated, for instance, that Meta mengei Blackwall and Meta segmentata (Clerck) were different species and not varieties.

In 1957 he shifted his attention to the spider-fauna of New Guinea. A large collection of spiders from that region came into his possession, sent to him by a colleague and priest who lived as a missionary in Merauke and Mindiptana, both in West New Guinea. The study of such a relatively unknown fauna posed many problems, due to inadequate descriptions, lost original material and possible synonymies. He devoted his attention to all these problems, visiting important museums (Frankfurt, Genoa, London and Paris) in order to attain his goal. His first series of publications on the Spiders from South New Guinea (1958-1968) contains descriptions and illustrations of all species met with, common and rare. The result is an important contribution to the fauna of the Oriental region, covering all families occurring there.

When the larger museums became aware of his progress, they were eager to offer him their own New Guinea collections which often, through lack of specialists, had remained untouched for considerable periods. A new series of Further notes on the spiders of New Guinea was well underway.

His list of publications consists of a hundred papers. They clearly show the evolutionary trend in his work, from general topics to specialised taxonomic subjects. That this series was interrupted so suddenly must be regretted deeply.

ABSTRACTS FROM THE CINCINNATI MEETINGS



The Eastern Regional Meetings were held this summer from June 19th to 21st, at the University of Cincinnati, Cincinnati, Ohio. GEORGE UETZ was the host, and has submitted the following abstracts of presented papers.

SPIDER COMMUNITY ECOLOGY OF RELICT PRAIRIES OF ADAMS CO., OHIO

Mike Bruggeman

A preliminary study of the arthropod fauna of relict prairies in Adams Co., Ohio, was undertaken to determine the degree of species and community structure similarity between prairie habitat and an old field habitat. Arthropods were sampled by sweep netting in several prairies and an old field during the summer of 1977. The prairie sites sampled represent two different remnant situations: a single, 1 ha open prairie adjacent to a 0.6 ha old field; and a cluster of smaller (0.5-.13 ha) prairies separated by forest vegetation.

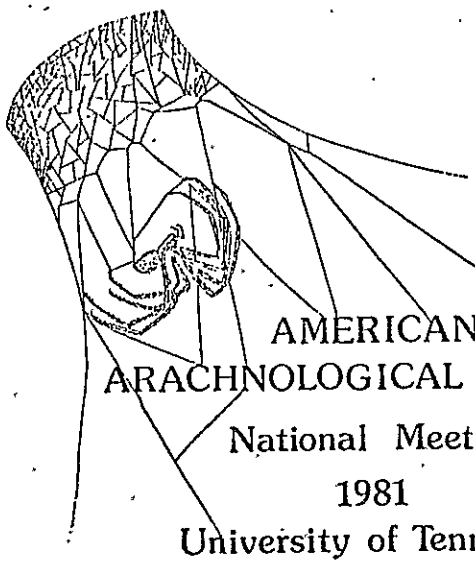
Similarity of species composition of the two prairie areas was greater than the similarity of either to the old field. As the growing season progressed, all areas became increasingly similar in composition, but prairies remained distinct from the old field. The old field had greater species richness (236 spp.) than either the Lynx Prairie cluster (151 spp.) or the Wilderness open prairie (155 spp.). However, the prairie areas had higher equitability than the old field, which showed a greater degree of species dominance. Arthropod community structure, expressed in species-abundance relationships, were extremely similar in the prairie areas. When the spider component of the arthropod community is examined, species similarity and community structure relationships are similar to those of the arthropod fauna as a whole.

In 1979, spiders in several prairie areas in The Lynx Prairie Preserve were sampled by sweep netting once a month from May to October. Species composition varied markedly between prairies and between collection dates. Community structure (species-abundance relationships) however, remained relatively constant between prairies and changed slightly over the season.

GEOGRAPHIC VARIATION IN THE SOCIAL GROUPING TENDENCY OF METEPEIRA SPINIPES (ARANEAE:ARANEIDAE)

G. W. Uetz, T. C. Kane and G. E. Stratton

An orb web building spider found in Mexico, Metepeira spinipes, occurs solitarily, but more frequently occurs in aggregations of 5-150 or more individuals. Although colonial, each individual maintains a web and retreat within the colony and captures its own prey. These aggregations would appear to be based in a degree of social interattraction. Spacing patterns suggest that these spiders tolerate conspecifics at closer distances than if individual web units were merely attached to each other. Aspects of the behavior and ecology of this species were studied during several trips to Mexico in 1978 and 1979.



AMERICAN ARACHNOLOGICAL SOCIETY

National Meeting

1981

University of Tennessee

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WHEN? 5-7 AUGUST
8-9 FIELD TRIPS

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Susan E. Riechert
Department of Zoology
University of Tennessee
Knoxville, Tennessee 37916

Group size in M. spinipes varies geographically over the range of habitats studied. In severe habitats where prey availability is low and environmental conditions are extreme, (high altitude; desert grassland), individuals are predominantly solitary or in small groups. In intermediate sites (agricultural areas with seasonal rainfall) spiders occur more frequently in aggregations. Differences in group size distributions between these sites would appear to be attributable to prey availability. In the tropical site, where climate is benign and favorable year-round, and insect abundance is great, colony size is very large. Group size distributions in all but one habitat (high altitude) were significantly different from a Poisson distribution, truncated at zero, indicating non-randomness.

Nearest neighbor distances decreased over this habitat gradient as well and show a significant negative correlation with prey availability. Apparently, individuals of M. spinipes can tolerate conspecifics at closer distances in areas of high prey availability. Field experiments in which colonies were moved and reestablished in areas of lower prey activity confirm this: nearest neighbor distance increased after transporting except where prey was supplemented by addition of attractants (cow dung).

The combination of solitary and colonial behaviors exhibited by this species suggests that it may represent an intermediate stage in the evolution of social behavior in orb-weaving spiders.

VISUAL ORIENTATION IN AN ORB-WEAVING SPIDER, ARANEUS DIADEMATUS CL. (ARANEIDAE)

John D. Crawford

Once the prey has been subdued, this spider returns directly to the hub of the vertical orb with its prey. Return behavior is disrupted in some individual spiders if the position of the light source, in the laboratory, is changed by 180° while the spider is subduing its prey. Spiders that are disoriented by this manipulation leave the prey capture point (P.C.P.) initially moving towards the web's edge to search for the hub. The response of individual spiders to this manipulation is quantitatively described by the orientation coefficients: the ratio of the straight distance, between the hub and P.C.P., to the total distance travelled by the animal upon leaving the P.C.P. This procedure resulted in disorienting 17 of 21 juvenile spiders (1st and 2nd molt). Only two control animals took an indirect path to the hub: the control procedure involved blinking the light source off and on again, without moving it, while the spider subdued its prey. Orientation coefficients of controls are significantly greater than those of experimentals ($p < .0.005$). The same experimental conditions imposed upon older spiders (3rd, 4th and 7th molt) resulted in disorienting half of the 20 spiders tested. Only two controls exhibited disorientation. Orientation coefficients of controls are significantly higher than those of experimentals ($p < 0.01$). Experimental orientation coefficients of older spiders are significantly higher than those of juveniles. It appears that visual orientation is important for this species of spider. As spiders mature the use of light as an orientational cue becomes less important and is replaced by some other as yet unidentified cue or cues.

THE CUTICULAR REFLECTORS OF CERTAIN SPIDERS

John A. Kochálka

Using a Nikon epi-illuminating compound microscope it was discovered that on the carapace and femora of Lycosidae (single female Lycosa examined) and at least on the femora of Anyphaenidae (single female of Josa examined) there are rows of spots which reflect light and appear silvery when positioned perpendicular to the axis of the objective lens. They appear black under polarized reflected light. The carapaces and femora of these spiders are covered with fine cuticular ridges forming a fingerprint-like pattern. The reflective spots usually are in irregularly elliptical areas about 20-25 microns long by 5-10 microns wide where there are no ridges. The absence of these ridges is not necessary for reflectivity.

It appears that the reflectivity of the spots is due to their microstructure, and not to their chemical composition. The author speculates that some substance extruded through a pore changes the microstructure of the cuticle so that it becomes reflective. The anyphaenid has slight iridescence on the legs and carapace, but this has nothing to do with the reflective spots.

A female Filistata hibernalis Hentz and an undetermined Ctenizidae were examined also, and no reflective spots were found. The spots could be used as a taxonomic character, and such research is in progress. The function of the spots is unknown.

WHY ARE THERE NO PARTHENOGENETIC SPIDERS?

Chris Starr

If, as Bristowe (1971) says, spiders of a species are always common where they are found, and given that spiders are in general not subject to the conditions described by Williams (1975) as favoring sex, two questions arise:

1.) Why is parthenogenesis so very rare (though not quite nonexistent) in spiders?

2.) Are spiders common because they have to be in order to find mates?

A number of testable hypotheses can be mined from this thesis. One of these in particular can be tested with data from the literature:

In a given area, rare species should be mostly long-sighted hunters and/or spinners of large webs, and not short-sighted hunters. This hypothesis does not stand the test and is rejected, and so is the entire thesis.

It is not possible from the literature to tell whether Bristowe's statement is correct, and I suggest that it is not. This would be the case if spiders are more skillful at finding mates than we might have thought, and can therefore get away with being rare. This still does not tell us why there are (almost) no parthenogenetic spiders, but it makes it less outrageous that there are not.

ACTIVITY AND COMMUNICATION IN THE COMMUNAL SPIDER, MALLOS GREGALIS (DICTYNIDAE)

W. David Hollar

In order to determine some factors which affect activity in a species of communal spiders, Mallos gregalis Simon, time-lapse motion pictures were taken before and after water was sprayed onto webs of 18 separate environmentally restricted colonies of spiders under one of three conditions: ample feeding (three flies per week), minimal feeding (one fly per two weeks), or acute administration of dextro-amphetamine sulfate to medium fed (one fly per week) colonies. Indices of group activity such as total number and duration of movements, numbers of contacts, and type of movement (i.e., across a distance or at one position) showed that little activity occurred and no condition differences were present before the spraying of water. After the addition of water, activity and the number of interactions increased across conditions. Amphetamine-treated groups exhibited more activity immediately post-water than did amply fed groups, while minimally fed groups were intermediately active. Increases in activity and interactions are suggested as an important adaptive mechanism for regulating communal life in M. gregalis. This work was supported by NSF grant BNS 74 09915 to Peter N. Witt.

ABSENCE OF AN ECOTONE EDGE EFFECT IN SCHIZOCOSA OCREATA (LYCOSIDAE)

A. B. Cady, W. J. Tietjen, and G. W. Uetz

Schizocosa ocreata was shown to occupy a wooded area and adjoining woods-field ecotone in equal proportions. These data refute a previous claim that populations of S. ocreata were confined to ecotones. Local patterns of distribution for this spider were attributed to microclimatic conditions. Deciduous leaf litter, herbaceous cover, soil moisture, and temperature seemed to have been the most important factors in determining S. ocreata's distributions. It was concluded that this spider should not be termed an "edge" species.

A COMPARISION OF INTERSPECIFIC COMPETITIVE EFFECTS AMONG SPIDER POPULATIONS OCCUPYING SANDSTONE CLIFFS IN EASTERN TENNESSEE

Susan E. Reichert and Alan B. Cady

The degree to which spider populations are limited by intra versus interspecific competition is assessed for four spider populations prominent on sandstone rock faces in eastern North America: the theridiid, Achaeranea tepidariorum (C. L. Koch), an araneid, Araneus cavaticus (Keyserling), an agelenid, Coelotes montanus (Emerton), and a hypochilid, Hypochilus thorellii (Marx). Discriminant and niche breadth analyses performed on the temporal, spatial, and functional niches of these species show aspects of the spatial niche to be the most important source of niche partitioning. Considerable overlap exists in both the diet and timing of the activity of these spiders.

Removal experiments were performed to examine potential changes in population size and spatial niche breadth when individual species are released from interspecific competition. The results obtained may indicate intraspecific regulation of some species' population densities.

SALTICIDS ON QUEEN ANNE'S LACE: RETREAT-SITE SELECTION AND PLANT GEOMETRY

Steven Tessler

Penultimate Phidippus and Metaphidippus jumping spiders build silken retreats on post-flowering umbels of Queen Anne's Lace (QAL; Daucus carota L.) in autumn; adult Metaphidippus return to dead QAL umbels in spring where mating and egg-laying occurs. Phidippus and Metaphidippus hunt and move horizontally through the field in different vertical strata in autumn. Phidippus spiders climb the QAL mainstem from the ground and follow it to the primary (largest) umbel located in the 'center' of the plant. Mainstemming may facilitate the relocation of nests. Metaphidippus spiders use aerial silk bridges to move through the field and nest in secondary umbels on the plant periphery. In spring, adult Metaphidippus nest in the primary umbels. Here, mainstemming may facilitate mate location for cohabitation.

AN EXPERIMENTAL STUDY OF COMPETITION AMONG ARGIOPE AURANTIA AND ARGIOPE TRIFASCIATA (ARANEIDAE)

Charles C. Horton and David H. Wise

An investigation of inter and intra specific competition among Argiope aurantia and A. trifasciata was carried out through experiments consisting of altering the densities of A. aurantia and A. trifasciata within adjacent 12X12 m plots in an old field, and recording the effects on resource utilization and life history parameters. The results indicate that increasing the density of conspecifics caused an increase in the selected web height in both species. The presence of A. aurantia at high densities caused an increase in the web height selected by A. trifasciata. The data also show that increasing the density of conspecifics caused a reduction in survivorship in A. trifasciata. The results indicate intraspecific competition as a factor affecting both species, and interspecific competition as a factor affecting the web height of A. trifasciata. It is suggested that these species are competing for suitable web space.

KARYOTYPES OF SOME LYCOSID SPIDERS

T. D. Gowan

Standard karyotyping techniques have proven of limited value in systematics of spiders. The new techniques of chromosome banding used in humans is being used more frequently to resolve relationships, phylogenies, and questions of distributional movements and introduction sources/ancestral homes. These techniques should prove very useful in studying taxonomy of closely related groups of species such as the Lycosa lenta group of spiders.

THE RELATIONSHIP BETWEEN PREY CONSUMPTION AND WEB RELOCATION IN A PERUVIAN POPULATION OF NEPHILA CLAVIPES (L.) (ARANEAE; ARANEIDAE)

Ann L. Rypstra

A high degree of mobility was apparent in a population of Nephila clavipes (L.) (Araneae; Araneidae) in southeastern Peru during the fall of 1979. Prey capture rates and cleptoparasite activities were observed to determine any relationships they might have to web movement. Individuals that moved within 48 hours after a 2 hour midday observation period had consumed significantly less prey than those that had not moved (Mann-Whitney U-test, $p < 0.01$). Prey consumption is significantly reduced by each additional cleptoparasite occupying the barrier webbing (Kruskal-Wallis pairwise comparisons, all significant at $p = 0.15$). Only one of six webs from which the cleptoparasites were removed and the prey capture was supplemented was observed to relocate its web.

EVALUATION OF THE LIMB BEATING SAMPLING METHOD FOR ESTIMATING SPIDER POPULATIONS ON APPLE TREES

J. P. McCaffrey and R. L. Horsburgh

The limb beating sampling method was evaluated with regards to its seasonal efficiency and the effects of the time of day of sampling. The efficiency of limb beating was generally high throughout the season with averages of 88%, 77%, and 84% for the Salticidae, Philodromidae, and total spiders, respectively. Reduced sampling efficiencies were noted for early instar Philodromus spp. spiderlings that were still closely associated with their egg case. There were no significant differences due to time of day in population estimates obtained for the Salticidae, Thomisidae, web-builders and total spiders during normal sampling hours (9:00 A.M. - 6:00 P.M.); however, during one sample date, more nocturnally active clubionids were collected at 3:00 A.M. than most other sample periods.

THE EVOLUTIONARY HISTORY OF THE EURYPTERIDS

Roy E. Plotnick

Eurypterids are a distinctive group of Paleozoic aquatic chelicerates. Their sister group relationships within the Chelicerata are a subject of current dispute. The eurypterids are represented in the fossil record by approximately 200 species distributed among 62 genera and 18 families. With the possible exception of a species from the Middle Cambrian of Bohemia, the earliest eurypterids are known from the Middle and Upper Ordovician of North America, South America, and Wales. Several of these early forms are highly specialized. The order diversified through the Silurian, reaching its maximum during the Ludlow and Pridoli stages (Upper Silurian). The group attains a nearly cosmopolitan distribution during this period. Diversity declined throughout the Devonian. Three new families appeared during the Carboniferous. The eurypterids apparently became extinct during the Permian, with the youngest eurypterid being known from the Leonardian (L. Middle Permian) of Kansas. Eurypterids are frequently found associated with early land plants, vertebrates, and arachnids.

DEVELOPMENT OF THE TRIANGLE SPIDER, HYPTIOTES CAVATUS (ULOBORIDAE)

B. D. Opell

Hyptiotes cavatus were reared in small containers with numerous supports and in large containers with a single rectangular support. Spiderlings emerged from eggsacs as second instars, but began constructing capture webs only as third instars. Most were mature in the sixth stadium, at which time males ceased to construct capture webs. Sex and container size had no influence on length of developmental stadia, total developmental time, number of webs produced by each instar, or total number of webs produced during development. Both males and females produced more webs in third and fifth stadia than in the fourth stadium. Measurements taken from webs produced by lab-reared spiders and from photographs of webs produced in the field were used to compute total framework length, functional framework length, total cribellar silk length, average spiral spacing, and total web area. In general, greater values were obtained for webs produced by females and for webs produced in large containers. However, field and laboratory data both indicate that in the fourth stadium males produce larger webs; whereas, in the fifth stadium female webs are larger and have more widely spaced capture elements.

INDUCED ENCOUNTERS AND WEB DISPLACEMENT BETWEEN FEMALE LABYRINTH SPIDERS, METEPEIRA LABYRINTHEA (ARANEIDAE)

David H. Wise and David Weiss

Contests over web sites by female labyrinth spiders were studied by inducing encounters between invaders and residents of known weight, and by following populations of marked spiders which had been introduced onto artificial web supports in the natural habitat. Over half of 88 induced encounters resulted in either web shaking, a chase, a fight, or a combination of these behaviors during the first five minutes following the introduction. Since some of the disputes were not immediately resolved, webs were visited 24 hours later to determine the eventual winner of the encounter. The heavier spider was more likely to win control of the web. There was no statistically significant evidence that the resident had an advantage in the contest. Spontaneous web invasions and displacements occurred in the populations of marked spiders. Out of 3 experimental populations (8, 13 and 35 spiders each), a total of 9 apparent web take-overs occurred, all in the highest density population. Six of the successful invaders were spiders which had been recently introduced onto the artificial web supports and had not yet built webs. Three displacements resulted from a spider leaving her web and taking over another, presumably as the result of a direct encounter. Successful invaders tended to be heavier than the expelled resident.

DID OXYOPID SPIDERS EVOLVE FROM AN AERIAL WEB-WEAVING ANCESTOR?

J. S. Rovner

When housed in laboratory cages, Peucetia viridans hang inverted from a layer of silk threads that they have attached to the ceiling. Considerable use of these suspension lines throughout prey capture is correlated with the presence of curved, ventrally serrated bristles near the tarsal claws, and an absence of adhesive hairs on the legs. Other features suggestive of an aerial web-weaving ancestor have been observed by previous workers and include: (1) copulation with the male and female suspended from silk lines; (2) egg sac construction and oviposition while hanging inverted; and (3) the construction of webs by juveniles. In light of our knowledge of evolutionary web reduction in various families I offer a crude, hypothetical scheme in which a tropical, aerial web-weaver gives rise to a Peucetia-like form, from which an Oxyopes-like spider is derived.

A COMPARISON OF WANDERING SPIDER COMMUNITIES IN THREE SITES ALONG A SUCCESSIONAL GRADIENT

Thomas Bultman

Wandering spiders from three communities representing a successional gradient (old field, oak and beech-maple forests) were sampled with pitfall traps and compared at the levels of species, family and guild. There was little similarity (species overlap) between communities. Species diversity was highest in the subclimax forest and considerably lower in the mature beech-maple forest. This successional trend in species diversity is discussed in light of current hypotheses. Analysis of guild composition showed that, with succession, the relative abundance of wolf spiders decreased while that of the vagrant web builders and crab spiders increased. Of the six families sampled, only members of the Clubionidae occurred in fairly constant numbers in each community. Structure of the litter is discussed as a factor influencing cursorial spider abundance and distribution.

CHELICERAL POLYMORPHISM IN ZYGOBALLUS (SALTICIDAE) AS A CONSEQUENCE OF ALLOMETRIC GROWTH

Dean B. Faber

A suspected allometric relationship between chelicera length and body size in male Zygoballus bettini was investigated. To minimize possible effects of geographic variation, all specimens available (24 males, 46 females) from a circumscribed geographic area in southern Michigan were studied. Power curve regressions of carapace width, carapace height, chelicera length, palp length, first leg length and second leg length on a general measure of body size (carapace length) were calculated for each sex. The allometric relationship was expressed as $Y = bX^k$. In females all body measurements varied nonallometrically (isogonically) with respect to carapace length ($k = 0.91 - 1.04$). In males chelicera length and first leg length were positively allometric (positively heterogonic) with respect to carapace length ($k = 1.43$ and 1.44, respectively). The other male body measurements were all isogonic with respect to carapace length ($k = 0.96 - 1.04$), with the exception of carapace height which was negatively heterogonic ($k = 0.84$).

Analysis of variance calculations on the carapace lengths of both sexes with respect to locality and with respect to date of collection yielded different results. Mean female carapace length was not significantly different at the .10 level with respect to either locality or date of collection. Mean male carapace length was not significantly different at the .10 level with respect to locality, but was significantly different at the .02 level with respect to date of collection. In view of the positively heterogonic relationships of chelicera length and first leg length with carapace length in male Z. bettini, a seasonal difference in body proportions of the male sex (seasonal polymorphism) is indicated.

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