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In this issue of AMERICAN ARACHNOLOGY:

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

NOTICE OF 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.

IX INTERNATIONAL CONGRESS OF ARACHNOLOGY

1-8 AUGUST, PANAMA CITY, PANAMA

by Norm PLATNICK and Robert RAVEN
AMNH, New York, NY 10024

About 125 participants in the Ninth International Congress were treated to warm hospitality (including a folk dance presentation at the pre-Congress social and an evening of typical Panamanian entertainment) and warm, humid weather. Some 80 talks were given over five and a half days, and many arachnologists unable to attend were represented by abstracts or poster presentations. Thanks to the tireless efforts of Barbara and Mike ROBINSON, Diomedes QUINTERO, and their colleagues and staff, the meeting went smoothly and enthusiastically. On Sunday, August 8, the participants sweltered and scrambled through the lush tropical lowland rainforests of the Soberania National Park. The potential dangers of which we had been warned (mostly hymenopterans, and perhaps sloths falling from trees!) failed to materialize, and all reservations about the climate vanished in the enthusiasm of finding such delights as Ricinulei, Schizomida, and an incredible diversity of orb-weaving uloborids and araneids. About twenty people also joined a five-day post-Congress excursion to northern Panama.

One symposium was held (on neurophysiology) and four main talks were given: Why are genitalia usually useful species characters?, W. G. EBERHARD; A spider's eight-legged problem to localize a stimulus source, F. G. BARTH and R. HERGENRODER; Desert adaptations of arachnids, J. L. CLOUDSLEY-THOMPSON; and The biology of the Soberania National Park, Delivered by several staff members of the Smithsonian Tropical Research INstitute.

Several other talks focused on such problems of spider phylogeny as the monophyly of orb webs (J. CODDINGTON), palpimanoid interrelationships (N. I. PLATNICK and R. R. FORSTER), scytodoid interrelationships (P. T. LEHTINEN), mygalomorph interrelationships (R. RAVEN), the evolution of male genitalia (O. KRAUS), and the significance of silk-handling behavior in a variety of araneomorph families (W. G. EBERHARD).

Talks of special interest to Americans included presentations on a possible new family of Neotropical "pisaurids" (J. E. CARICO), Miagrammopes systematics (B. OPELL), ant-mimicking orb-weavers (H. W. LEVI), the bionomics of Peckhamia (E. A. MATELSKI and N. V. HORNER), Neriene life history (D. WISE), orb web construction in Dinopidae (J. CODDINGTON, and not a misprint!), spider prey of Trypoxylon wasps (C. E. GRISWOLD), the New World solpugid families (E. A. MAURY), courtship and mating in Euagrus (F. A. COYLE), reproductive biology of Scytodes (C. E. VALERIO), possible neoteny in Pacific coast opilionids (T. S. BRIGGS), the pulvinate amblypygids (D. QUINTERO), Texas gnaphosids (G. ZOLNEROWICH), retreat construction in the salticid Uluella (J. REISKIND), electrophoresis of Bothriocyrtum (M. GALINDO-RAMIREZ), and Atypoides natural history (L. S. VINCENT, who also became the first arachnologist to get married while at a Congress!).

Although the meeting was not as well-attended by Europeans as in the past, people did gather from far-flung locales: Val DAVIES from Australia, Ray and Lyn FORSTER and David COURT from New Zealand, Emilio MAURY from Argentina, B. K. TIKADER and B. H. PATEL from India, and Charles GRISWOLD, en route to his new position at the Natal Museum.

A C.I.D.A. meeting was convened, and members decided to accept the invitation of Dr. Maria RAMBLA to hold the 1986 Congress in the Spanish Pyrenees (the BONNET's will not have to travel as far as they did this year!). A new president was installed (Peter VAN HELSDINGEN) and copies of the new "Annuaire des Arachnologistes Mondiaux" were made available.

1983 WESTERN SECTION MEETING

James C. Cokendolpher
Department of Biological Sciences
Texas Tech University
Lubbock, TX

The Western Regional Meeting of the American Arachnological Society was organized as part of the 64th Annual Meeting of the Pacific Division and the 59th Annual Meeting of the Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science. The AAAS meetings were held on the campus of Utah State University from the 19th to the 23rd of June, with the AAS meeting being held on the 20th to 22nd of June. The AAS section of the meetings was organized by Kate WING and Eric ZURCHER. Additional planning and support were provided by James MacMAHON. All of which are heartily thanked.

Although attendance was low, the 15 individuals and Serendipity (Russel GABEL's well-mannered canine) represented seven western USA states and Israel. James MacMAHON chaired the paper sessions and discussions, and Eric ZURCHER led the field trips. In addition to the presented papers (abstracts to follow), those attending the meeting were treated to slide shows and discussions. James MacMAHON's topics were succession of the fauna and flora of Mt. St. Helens and reclamation of lands strip mined for coal near Kemmerer, Wyoming. Israel and its many habitats were presented by Amnon REISS. James COKENDOLPHER briefly noted the discovery of a fossil harvestman from Dominican Republic amber. Due to the AAS By-Laws, no business meeting was held as only one member of the Executive Committee was present.

Three field trips were organized. Afternoon trips were made to Green Canyon and Logan Canyon. An all-day excursion was made to the Raft River Mountains. At Green Canyon (see J. Arachnol. 1983, vol. 11, pp. 31-50) the Sagebrush Steppe investigated by Barbara ABRAHAM, Cindy HATLEY, James ROBINSON, Kate WING, and Eric ZURCHER during the course of their graduate studies was visited. The trip up Logan Canyon to the summit and to Bear Lake not only yielded numerous spiders, mites, and harvestmen, but also gave those attending a bird's eye view of Willis GERTSCH's hometown, Montpelier, Idaho. The firs and montane meadow (with snow!) were a pleasant relief for many of the desert inhabiting arachnologists on the excursion. Those on the all-day trip to the Raft River Mountains in the northwest corner of Utah revisited some of the sites first studied arachnologically 50 years ago by R. V. CHAMBERLIN and Wilton IVIE. A good time was had by all, including Serendipity.

As with all meetings, the evenings were set aside for food, drink, and conversation. James MacMAHON supplied the food, drink, and site for the first evening get together. MacMAHON not only supplied more pizza fixings than could be eaten, but his home provided a beautiful setting with a yard filled with a forest of both native and exotic (eastern species) trees. The second evening was spent at a barbeque supper at the home of Vince TEPEDINO. Members of the Botanical Society of America and the Ecological Society of America also attended the barbeque supper.

FOOD OR FORM: DO SPIDERS MAKE A CHOICE?

Kate Wing

This study assessed the effects of vegetation architecture and insect abundance on the composition of spider species (numbers and abundance) in big sage shrubs (Artemisia tridentata) in northeastern Utah. Using a factorial experimental design, treatments of 2 levels of foliage density--control and tied--and 2 levels of insect abundance--control and baited--were applied to big sage shrubs. Microweather differences between the 2 types of shrub architecture were not significantly different. Insect numbers were not significantly increased by foliage density treatment. Numbers of ambush hunting spiders significantly increased in the tied, more foliage-dense shrubs. Numbers of spiders hunting by actively running and jumping increased significantly in shrubs baited to increase insect abundance. Observations of spiders moving and hunting within shrubs suggest that differences between species activity and size scale of hunting area may account for the differential response by spider species to vegetation architecture and insect abundance.

ARE THERE OPTIMAL FORAGING PATTERNS AMONG TETRAGNATHID SPIDERS?

Amnon Reiss

Observations of 72 webs of Tetragnatha nitens were made at Arugot waddi, Ein Geddi oasis on the northwestern coast of the Dean Sea in Israel. The webs were found to be orientated at a variety of slopes to the water surface and the relationships between these angles and prey capture efficiency of the webs were examined. It was determined that 72% were oriented between 10-50° to the water surface and only 23% were 50-90°. There was a high correlation between the number of insects captured and angle of the web. If these results extend to all T. nitens in Israel, the prediction of having an optimal foraging pattern can be expected.

SPECIES DENSITY OF NORTH AMERICAN THERIDIIDAE

Eric Zurcher

A species density map for the family Theridiidae in the United States and Canada was prepared from the checklist and citations of Levi and Randolph (1975). This map is compared with similar maps for mammals, breeding birds, reptiles, and amphibians. Parallels with these vertebrate gorups, particularly with the amphibians, are noted. Species density increases from west to east and from north to south across the continent. High species density appears to be generally associated with the presence of broad-leaved forests. Some regions in mid-continent which appear to exhibit very low species density may reflect a lack of intensive collecting within those areas, rather than a low species density per se.

A REVIEW OF APPENDOTOMY IN SPIDERS AND OTHER ARACHNIDS

Vincent D. Roth

A historical review is presented for appendotomy, a collective term for autotomy, autotilly and autospasy. Examples are given for each category. Autotomy, the reflex detachment of an appendage, occurs rarely among spiders. Autotilly, the self-removal of an appendage, occurs in most spiders with damaged appendages and in several genera which remove one palp before or both after mating. Autospasy, the separation of appendages with assistance of an outside source, occurs at one of three points or not at all: at the coxatrochanter joint, the patella-tibia junction, or across the basal part of the patella. The degree of resistance to autospasy varies between families and is not related to slenderness of legs. Hersiliidae are added to the list of spiders in which autospasy occurs at the patella-tibia juncture. Five additional genera of the Agelenidae show evidence of patella division, Blabomma, Cybaeota, Cybaeozyga, Ethobuella and Yorima. The 52 families of spiders studied are arranged in the order of ease with which their legs detach. Selenopidae, Philodromidae and Pholcidae contain the species most susceptible to leg detachment. Sixteen families show little or no sign of autospasy.

ARBOREAL SPIDERS OF THE CONIFEROUS FORESTS OF THE PACIFIC NORTHWEST

Andrew Moldenke, Becky Fichter, and W. P. Stephen

Intensive sampling throughout the year in seven different conifer forest types in Oregon has documented low diversity. Most arboreal species are widespread taxa occurring with high predictability in similar forest types; the Pacific Northwest coast has a high proportion of species restricted to this particular climate. Arboreal spiders apportion the year differentially; few species are equivalently active during the winter and summer. Of the most abundant arboreal species, most have biennial life cycles (36) with eggs hatching in the early fall and adults produced during summer of the second year (35); others have annual cycles, hatching in spring and maturing in late fall (4) or hatching in mid-summer and maturing the following spring (13). In a mixed forest, arboreal spider species show strong host-tree specificity; the preferred tree species may differ between sites. Studies are underway to determine the microclimatic regimes and the 3-dimensional habitat spaces preferred by different spider species.

RANDOM NOTES

These comments on cameras come from Jerry ROVNER:

"Of particular interest was Alan CROOKER's first article in what promises to be a useful series. I was excited about the Pentax LX that he mentioned as one of the several available TTL flash metering cameras. I already have Pentax equipment and looked forward to purchasing an LX body. Then I found out the price--too steep for me, as this model is designed for professional photographers."

"Happily, a recent issue of Modern Photography (July, 1983) contains a review of the newest Pentax camera, the Super Program, which includes TTL flash metering among its features. The Super Program with lens can be purchased for about $230; without lens (my situation) the price is about $180. Along with the required pair of dedicated flashes (about $45 each), I'll be able to add this capability to my system at a reasonable cost."

A reminder from Peter GABBUTT:

"I am sure that you know that "A catalogue of the Araneae described between 1940 and 1981" by P. M. BRIGNOLI has recently been published through the co-operation of the Manchester University Press, the Royal Society and the British Arachnological Society. Its publication has involved the B.A.S. in commiting a substantial part of its reserves to fund the venture. Naturally we should like to see some return on our investment so that we are in a position to support further arachnological work of international interest in the future. For instance it is possible that supplements to the present catalogue could be published at intervals of four or five years to ensure that our taxonomic sources are kept up to date. This, of course, would depend on the success we have with sales of the present volume. I do, therefore, urge members of AAS to take advantage of the publisher's offer of a special discount price which has recently been circulated to all members. Perhaps, more important, members who are associated with universities or other institutions should persuade their libraries to buy copies of the catalogue particularly if they already possess either ROEWER's "Katalog der Araneae" or BONNET's "Bibliographia Araneorum". These additional sales might make all the difference in judging between possible success or failure of further publications in the future."

The Editor of the Journal of Arachnology is soliciting cover illustrations for volumes 12-22 (or more). The first 11 volumes each featured a drawing of a different order of living arachnids. Since no drawings of the fossil orders have been submitted for consideration, we must start all over again. However, this time instead of drawings we want good photographs to be published in black and white. We can accept black and white prints (6 in X 5 in., minimum size), or color slides only (no color prints), of each order of arachnids (sensu lato, including scorpions and eurypterids) living or fossil. Entries will be judged by an impartial panel of judges (if we can find one!), and decisions will be final--i.e., contestants will find out if they won when the volume featuring that order is printed (11 years from now, or more, for the last order!). Therefore, submissions can NOT be returned. (It is possible that the slides will be shown at a "photo salon" at the next meetings, and the membership at large asked to vote on the winner of each order). Send your entries to Dr. Oscar F. FRANCKE, Department of Biological Sciences, Texas Tech University, Lubbock, Texas 79409.

We're reviving our quiz feature with this submission from G. B. EDWARDS. The answers are to be found later in this issue.

NOMENCLATURAL BEDFELLOWS

Can you identify the following famous (?) authors from their often (?) used initials (how much room do we have on a label, anyway?)? Only a few are of modern vintage, and a couple are really obscure! Hint: All combinations described new species.

B & C
D & R
G & I
P & P
G & A
W & E
G & M
L & L
I & B
C & G
G & P
M & G
G & J
P & S
G & D
P & W
G & R
C & I
G & W
L & D
C & B
T, D & R

1983 EASTERN SECTION MEETING

Barbara Abraham
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Hampton Institute
Hampton, VA

The 1983 Eastern Division Meeting of the American Arachnological Society was hosted by J. ROVNER at Ohio University (Athens) on June 24-27. Sixty-four persons preregistered, and last-minute arrivals included V. ROTH, who came directly from the Western Section Meeting.

During registration and the social on Friday evening, an innovation in meeting memorabilia, the official SPIDER SKI CAP, was on sale in lieu of tee shirts.

On Saturday four papers on systematics and seven papers on ecology were read. Saturday evening's event, a picnic at Dow Lake (which was eventually located by everyone--even A. BRADY), was enjoyed by all. D. WISE's Enoplognatha hunting party, however, came back empty-handed.

On Sunday four papers on physiology and seven papers on behavior were presented. The afternoon ended with "Miscellanea". M. GREENSTONE requested Society help in convincing the USDA to hire a systematic arachnologist. This led to a general discussion of the complementary needs of systematic and ecological arachnologists regarding specimen identifications.

Next AAS President J. REISKIND coined a term by explaining how monotaxophilia (the love of spiders, of course, in this case) has contributed to biology. The "Miscellanea" section was rounded off by B. TIETJEN and A. CADY's imaginative presentation on teleportation as a comprehensive model for explaining diverse problems in spider biology.

After a brief business meeting, participants retired to a steak dinner, which was served on campus. Sunday evening's festivities continued with music (on stage, this time!) by the melodious voice and guitar of G. UETZ. The evening ended with slides of tropical spiders (mostly salticids, of course) by G. B. EDWARDS, more of G. STRATTON's triple-X rated spider movies, a film by S. SKINNER, and a rerun of the classic "Life on a Silken Thread."

Although the weather remained hot and humid, Monday's field trip to Hocking Hills State Park provided some good collecting and lots of photogenic scenery. B. SHEAR dug up Antrodiaetus, V. ROTH pointed out Calymmaria, and the box lunch was enjoyed by all.

Many thanks are due J. ROVNER and the folks at Ohio U. for a well-organized, enjoyable and informative get-together.

ABSTRACTS FROM 1983 EASTERN SECTION MEETING

EVOLUTION OF COOPERATIVE PREY CAPTURE AND FEEDING IN COMMUNAL SPIDERS

George T. Uetz

A model is proposed which predicts that cooperative prey capture and feeding is advantageous to spiders living in groups when the prey size/spider size ratio exceeds 1.5. Cooperation among spiders increases capture success and improves feeding efficiency, and is advantageous to the individual when the cost of defending a prey item (at the risk of losing it) is greater than the cost of sharing it with other spiders. Data from studies of Mallos gregalis (Dictynidae) and other communal spiders are examined in light of this model.

THE EXTINCT ORDERS OF ARACHNIDS

William A. Shear

The nominal orders Phalangiotarbida (Architarbi), Haptopoda, Anthracomarti, Trigonotarbida, and Kustarachnae have been variously placed in recent chelicerate phylogenies. The placements were based, as in the past, on the studies of Petrunkevitch--about which there are serious questions among paleontologists. Four of the orders are known only from the Carboniferous; trigonotarbids also occur earlier (Devonian). Trigonotarbids are the sister-group of the Araneae and Amblypygi taken together, kustarachnids seem most like Uropygi and/or Schizomida, and haptopods may well be close to the Opiliones. Phalangiotarbids have many highly unusual characteristics that may indicate an aquatic habitat.

SYSTEMATIC PROBLEMS IN THE LYCOSA HELLUO SPECIES GROUP

Allen R. Brady

The nomenclature of large lycosids has been complicated by the addition of numerous generic names (Roewer, 1958) which appear to have little evolutionary basis. In addition the type species of the genus, Lycosa tarentula (Linnaeus), has few close relatives in North America. Species belonging to the Lycosa helluo group are recognized by similarity in color pattern, epigynal shape, and male palpal structure. Correlation of these characteristics with eye arrangement, and length of legs compared to carapace dimensions will be used to elucidate relationships of species belonging to the helluo group. Certain features of the eye arrangement and length of legs relative to carapace dimensions appear to be consistently similar within lycosid species groups and different between species groups. Habitat preferences and behavioral attributes also supply significant information concerning systematic relationships.

AN OVERVIEW OF MIAGRAMMOPES SYSTEMATICS (ARANEAE: ULOBORIDAE).

Brent D. Opell

As broadly defined, the genus Miagrammopes is characterized by a flat, rectangular carapace which retains only the posterior eyes and features promiment lateral eye tubercles and a pair of unique, central, paraxial apodemes. It is represented by 27 Neotropical, 12 Australian, six Oriental, and four Ethiopian species, but, aside from one Mexican species, does not have Holarctic members. The primary median apophysis of the male's palpus is responsible for coupling with the epigynum as shown by complementary changes of the two structures both within and between species groups. Cladistic analysis of carapace, sternite, and genitalic features divides Miagrammopes into one group represented in all regions and another with only Neotropical and Australian members.

THE LIMITS OF PALPIMANOIDEA, OR, WHAT IS AN ARANEOID?

Norman I. Platnick and Raymond R. Forster

A cladistic analysis of the results of a comparative morphological survey of the archaeid spiders and their relatives (Archaeidae, Mecysmaucheniidae, and two new families) indicates that recent hypotheses by Lehtinen and Levi assigning these taxa to two different superfamilies (Araneoidea and Palpimanoidea) should be rejected. The four families are judged instead to represent a monophyletic group which, along with the Textricellidae, Micropholcommatidae, and Mimetidae, belongs in the Palpimanoidea rather than Araneoidea.

LIFE HISTORY OF THE MYGALOMORPH SPIDER ANTRODIAETUS UNICOLOR IN WESTERN NORTH CAROLINA

Nancy L. Reagan and William C. McGimsey

Antrodiaetus unicolor is a primitive burrowing spider found primarily in the southern Appalachian region of the eastern United States. The purpose of this study was to determine the life history of a population of A. unicolor in western North Carolina. Age classes were identified from size-frequency histograms constructed from 874 burrow measurements taken during the summer of 1982, and from histological observations of developing reproductive structures of immature spiders. Both sexes appear to reach maturity 4 years post-hatching. Males survive for only one reproductive season, while females may live for as many as four years after reaching maturity, and are capable of reproducing annually.

CICURINA BRYANTAE EXLINE: A DISCUSSION OF THE SPIDER AND ITS RETREAT. (AGELENIDAE, CRYPHOECEAE)

Robert G. Bennett

Cicurina bryantae Ex. has been rarely collected. Described in 1936 on the basis of one female, it has remained over the years a poorly known species. A single male was tentatively identified in 1972. But, as with other reportedly rare organisms, it has been found recently that this species is actually quite common over its range. This paper is an account of the biology of this spider as it has been noted by the author. Details of habitat and microhabitat are discussed as well as the very interesting retreat construct common to adults and immatures of both sexes. This retreat is very similar to constructs reported for Japanese cavernicolous cybaeinine agelenids.

SPIDER EGG COCOONS: THEIR ROLE IN PARASITE ATTACK

Craig S. Hieber

The cocoon as a reproductive strategy against parasite attack is currently being studied for two species of orb-weaving spiders, Argiope aurantia and Mecynogea lemniscata. Preliminary data (and speculation) on the timing of cocoon production, the location of cocoons within the habitat, and the architecture of cocoons with regard to parasite attack are presented.

FACTORS AFFECTING THE DISTRIBUTION AND ABUNDANCE OF AN ERIGONID SPIDER IN A FLORIDA SALT MARSH

Jan C. Weaver

A small erigonid spider was the most abundant spider in a Florida salt marsh. Spiders endure submersion by daily tides (by crouching) in the leaf axils of smooth cord-grass, Spartina alterniflora. The spider does not use a captured bubble of air and does not appear to use plastron respiration to respire under water. Spiders do not discriminate between plants at a site or perceive them as a limiting resource (i.e., compete for them). There is considerable variation in spider densities and population dynamics in different parts of the marsh, which is suggestively but not significantly correlated with plant characteristics (density, height and number of leaves). Cannibalism and predation on the leafhopper Prolelesia marginata (Homoptera: Delphacidae) were observed in the field. Feeding trials indicate a liking by the spider for P. marginata. Interestingly, spider numbers were negatively (though not significantly) correlated with P. marginata numbers.

HABITAT ASSOCIATION AND FORAGING STRATEGIES OF TWO POPULATIONS OF THE LONG JAWED ORB WEAVING SPIDER TETRAGNATHA ELONGATA

Rosemary G. Gillespie

Tetragnatha elongata was studied in an endeavour to find whether its pattern of dispersion is non-random. Two populations from different habitats were examined. Measurements were made on various aspects of the environment, as well as on the webs themselves, and the spider occupant, to find out with what physical and structural features the webs are associated. Spiders are found to exhibit a significant association with areas of slow moving water; and where this condition is met, they appear to build in areas of high light intensity. But the populations examined differed markedly in both density and foraging strategy. These differences are discussed.

IMPORTANCE OF THE SHRUB STRATUM TO GROUND-DWELLING SPIDERS IN SHRUB-STEPPE

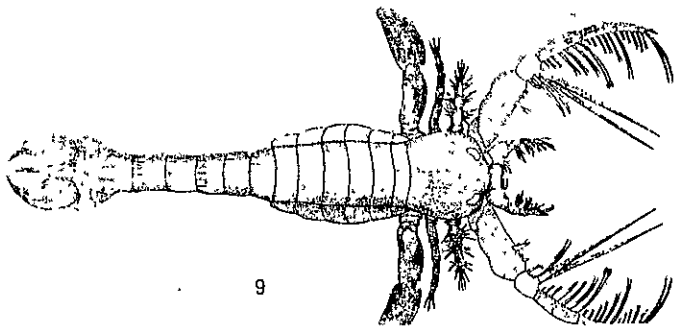
Barbara J. Abraham and Robert R. Parmenter

A field experiment was performed in Wyoming shrub-steppe to detect effects on ground-dwelling spiders of removing the shrub stratum. Control and "shrub removal" plots, as well as a strip-mined plot which was revegetated with grasses, had similar abundance of spiders, species richness, diversity and evenness. Similarity of spider assemblages (measured by Jaccard's and Schoener's Indices) ranged from 18% to 50% in control and shrub removal plots, 0% to 35% in control and revegetated plots, and 0% to 26% in shrub removal and revegetated plots through the season. A different species of spider was dominant in each plot. These results may accrue from patchy distributions (many rare species) overriding habitat effects of shrubs on ground-dwelling spider assemblages in shrub-steppe.

EXPERIMENTAL STUDIES OF THE INTERACTIONS BETWEEN A WEB-INVADING SPIDER AND TWO HOST SPECIES

Scott F. Larcher and David H. Wise

Field experiments were conducted to establish the effect of the web-invading spider, Argyrodes trigonum on two spider species that serve as its host, Neriene radiata and Metepeira labyrinthea. Experiments investigated: (1) the effect of host-Argyrodes size differentials on the rate of host emigration and mortality, (2) the rate of Argyrodes immigration to and emigration from host-occupied and host-unoccupied webs, (3) the effect of additional food on host and Argyrodes emigration, and (4) the use of host webs by Argyrodes. Significant host emigration occurred when the host-Argyrodes weight ratio was less than 10:1. Additional food had no effect on host or Argyrodes emigration, and Argyrodes will immigrate to and emigrate from host-occupied and host-unoccupied webs with equal frequency. Argyrodes will utilize the host web to capture prey following the host's emigration.



INVESTIGATIONS OF COMPETITIVE COEXISTENCE BETWEEN TWO SPECIES OF CLIFF DWELLING SPIDERS

Alan B. Cady

Experiments with two prominent members of a spider cliff community (Achaearanea tepidariorum, Coelotes montanus) were performed over three field seasons. Single species removal experiments (where only A. t. or C. m. were removed) resulted in an increase in the weight of the adult spiders on the experimental cliffs. Egg sac number and weight also increased. However, the static number of A. t. adults and decrease of immature numbers, even with increased reproduction, indicates that intraspecific competition regulates this population. An additional experiment resulted in a large amount of cannibalism among A. t., further indicating that the intraspecific competition is for micro-habitat space. The increased population numbers and reproduction of C. m. on the removal cliffs is attributed to decreased predation of C. m. by A. t..

A TEST FOR INTERSPECIFIC COMPETITION IN A GUILD OF RAPTORIAL SPIDERS

M. Turner

A study of the patterns of coexistence of four species of raptorial spiders was conducted from 1980-1982. The guild was comprised of three species of Thomisidae (Misumenops) and one species of Oxyopidae (Peucetia viridans). A removal experiment was done over a two year period to test for interspecific competition. Population densities of the other species did not show any significant increase in response to reducing the density of the dominant species of P. viridans. Several aspects of the study indicate the apparent absence of competition in these spiders is most likely a function of the variable environment in which they coexist. These aspects are discussed.

A MODEL FOR SPIDER AERONAUTIC BEHAVIOR

Matthew H. Greenstone

Spider ballooning is placed in ecological context by analogy with insect dispersal by flight. Spider and insect dispersal are both initiated by upward "flight" and both essentially passive. However, spiders probably do not exhibit an oogenesis-flight syndrome, have a dichotomy in reproductive value of migrants, and may not be capable of habitat selection when alighting. An adaptation and expansion of Southwood's time and space reproductive success model is used to make testable hypotheses concerning the distribution and intensity of ballooning tendency.

METALLIC SETAE ON NEPHILA CLAVIPES: EVIDENCE AGAINST AN INSULATIVE FUNCTION

James E. Carrel

Highly reflectant setae on the dorsal cephalothorax of Nephila clavipes appear to have little insulative value. Three lines of evidence support this conclusion. First, when exposed to various light sources, the heating curves of spiders before and after removal of setae are identical. Second, the cooling curves of warmed spiders with and without setae are identical. Third, color infrared (CIR) images of both kinds of spiders fail to show any thermal differences. Hence, there is no evidence to support the suggestion that metallic setae in this species prevent overheating when spiders are exposed to intense sunlight.

FUNGAL SPORES ASSOCIATED WITH LYCOSIDS IN SIX RIPARIAN COMMUNITIES

R. W. Cohen and D. E. Bianchi

Spiders from the genus Lycosa were surveyed for associated fungal spores from six different stream-side communities in Southern California. None of the fungi surveyed were pathogenic to the spiders. The presence or absence, abundance or paucity of certain fungal spores and bacteria can be correlated with the amount of human use. In addition, we attempted to infect wolf spiders with a known entomophagous fungi Beauvaria bassiana. However none of the fifty replicates produced an infection. Whole, surface sterilized, living spiders were crushed onto agar plates spread with Beauvaria spores. Clear zones of fungal inhibition were observed surrounding the crushed spider. These observations led to the conclusion that spiders may have a defense mechanism preventing fungal germination.

OBSERVATIONS ON THE STRUCTURE AND HISTOCHEMISTRY OF THE SILK PRODUCTION SYSTEM OF THE FUNNEL-WEB SPIDER GENUS EUAGRUS (DIPLURIDAE)

Jacqueline Marie Palmer

Specimens of the funnel-web spider genus Euagrus (Dipluridae) were fixed in ethanol:acetic acid (3:1), embedded in Para-plast Plus and serially sectioned at 7.0μ. The silk glands were studied using a variety of absorption and fluorescent histochemical techniques. The silk glands are all alike histochemically. Each gland secretes two types of protein into its lumen, acidic protein being produced in the distal hemisphere and complex glycoprotein in the proximal region. The four spinnerets are served by four clusters of irregularly shaped glands ranging widely in size. The diameter of the silk is 0.2μ to 0.5μ and is probably polyfilamentous.

THE GRAVITY SENSE OF ARANEUS SERICATUS

Alfred Finck

The gravito-inertial transfer function of A. sericatus was evaluated by changes in the cardiac reflex. Between 1.001 and 1.5Gz the data are best fit by a log function. Varnishing the patellar lyriform organs produces a decrease in Gz sensitivity. It is hypothesized that the lyriform/cardiac pump system maintains the equilibrium of the spider when the magnitude or direction of the gravito-inertial field changes. (Supported by NASA grant NAGW 242).

DISCOVERY OF THE WEBS OF THE ATYPID SPHODROS NIGER

Joseph A. Beatty
(abstract by the editor)

The purse web of Sphodros niger, an atypid spider distributed through the eastern part of North America from North Carolina to Ontario and west to Wisconsin and Kansas, has never been observed. A population of this spider was located in a lawn on Middle Bass Island, Erie Co., Ohio. The webs were tubes lying horizontally along the ground in the grass thatch. All other species of Sphodros for which webs are known make vertical tubes on tree-trunks; the horizontal tube habit is more characteristic of Atypus species, including A. snetsingeri, the only Atypus species known from America. This discovery makes it likely that the atypid studied by Poteat (1890) was S. atlanticus and not S. niger.

LOCATION AND ORIENTATION SYSTEMS IN A LINYPHIID SPIDER

Robert B. Suter

The bowl and doily spider (Frontinella pyramitela) is highly predictable both with respect to its location on the web and with respect to the orientation of its longitudinal axis while at rest and during locomotion. The cues used in location and orientation are not always obvious: solar orientation does not depend upon visual light reception; orientation during mate finding depends not only on vibrational information but also on gravitational and web-structural information; and location at the lowest point of the web's bowl depends not on gravitational but on web-structural information. The roles of light, gravity, web-structure and vibrations in orientation and location on the web will be discussed.

TACTIC RESPONSES OF GOLDEN SILK SPIDERLINGS

Donald L. Kimmel, Jr.

Nephila clavipes spiderlings undergo a change in attitude before dispersion and adoption of the adult life style. We are interested in what environmental cue(s) they use since the attitude change is first and lasts for life.

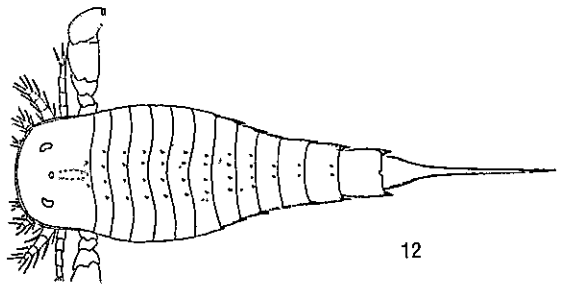
Fifty-two groups of 10-20 2nd instar spiderlings from 4 egg sacs were placed on cotton origins and the relative locations of the 1st stable communal webs scored. The direction of migration thus gave their response to varied time after emergence, substratum orientation, and light direction.

Newly-emerged spiderlings move predominantly toward light when light and gravity are opposed (N=13, freq.=0.54) or when gravity is neutral (N=6, freq.=1.00). 5-7 d after emergence, 6 groups in the dark and 12 lit from below were all negatively geotactic. All groups older than 3 d and lit from below move up. Spiderlings respond to both light and gravity, the latter coming to dominate before the second molt. They appear to ignore magnetism.

INFLUENCE OF APOSEMATIC PREY ON THE WEB STRUCTURE AND PREDATORY BEHAVIOR OF ZYGIELLA X-NOTATA

Stephen B. Malcolm

In order to determine whether prey toxins can disrupt web construction and predatory behavior of an araneid spider, immature Zygiella x-notata were fed, 1) Alphis nerii, an aposematic aphid that contains two plant-derived cardenolides (toxic steroids), 2) Acyrthosiphon pisum, a cryptic, palatable control aphid, 3) the cardenolide digitoxin in sucrose solution and A. pisum, 4) the cardenolide ouabain in sucrose solution and A. pisum. Results show that spiders in the A. nerii and digitoxin treatments built disrupted webs with reduced sticky areas and increased mesh sizes, but that these changes were reversible. Both toxic and palatable aphids were attacked and killed but only A. pisum was eaten, the bright yellow A. nerii being discarded. The evolutionary significance of a predator killing aposematic prey which it does not exploit is commented on.



COMPARISON OF COURTSHIP BEHAVIORS AND INTERSPECIFIC MATINGS IN THE SCHIZOCOSA OCREATA SPECIES COMPLEX

Gail E. Stratton

Schizocosa ocreata, S. rovneri, S. crassipes and S. floridana are members of the same species group based on the morphology of their genitalia. Mature males of ocreata and crassipes have tufts of bristles on the tibiae of their forelegs. The courtship of these species involves tapping, waving, arching and vibrating the forelegs. Mature males of rovneri and floridana lack the tufts of bristles; their courtship does not involve movement of the forelegs. Interspecific crosses were attempted between all species in this species group. Preliminary data suggest that males will court females of all species with the exception of ocreata males courting crassipes females, and floridana males courting ocreata females. With one exception females did not respond positively to the courtship of heterospecific males (N-30). In the instance where a crassipes female responded positively to an ocreata male, there appeared to be mechanical barriers preventing successful insertions of the male palp.

EFFECTS OF GROUP SIZE ON ACTIVITY AND WEB STRUCTURE IN THE SOCIAL SPIDER MALLOS GREGALIS (ARANEAE, DICTYNIDAE)

W. J. Tietjen

Colonies of size 1,2,5,10 and 20 animals per grouping were monitored with the aid of a computer-controlled camera. Colonies of size five or more exhibited similar measures of web density and complexity and were qualitatively similar to nests built by several hundred spiders in the laboratory and the field. Webs built by one or two spiders lacked the complexity seen in the larger groups and were more similar to the constructions of solitary sheet-web weavers. The mean silk deposition per spider was inversely proportional to colony size. Colony activity showed an exponential relationship to group size and exhibited evidence for a group effect in the patterning of activity bouts. It is suggested that these factors explain in part the advantages of group-living in this unusual social species.

HABITAT SELECTION AND BEHAVIOR OF PHILOPONELLA REPUBLICANA COLONIES

Deborah Smith

Philoponella republicana (Uloboridae) is a communal orb-weaving spider found in Panama, Trinidad and northern South America. I studied colonies of P. republicana in Trinidad (July 1978) and Suriname (February-May 1980, February 1982) investigating colony development, colony response to food deprivation and web destruction, and habitat selection in regard to forest type, complexity of the understory, and insect abundance.

Philoponella republicana colonies appear to select habitat on two scales. On a large scale, colonies were found more frequently in high/mountain savannah interface than in either high rainforest of mountain savannah forest. The choice of forest type does not appear to be based on differences in insect abundance among the forest types, but is correlated with greater complexity of the understory in interface forest. This may be due to the need for supports for colony attachment lines. On a smaller scale, the location of colonies within a forest type is correlated with insect abundance.

THE EVOLUTION OF COOPERATION IN THE WEST AFRICAN SPIDER, AGELENA CONSOCIATA: A PROGRESS REPORT

Susan E. Riechert

Two alternative hypotheses are tested: 1) that cost/benefit criteria to individual fitness alone underlie the cooperative behavior observed in this spider; and 2) that some degree of kin selection was required either for the initiation of cooperative behavior or its maintenance in this species. The problem was structured as an evolutionary game with data collection centering on positive and negative payoffs associated with the exhibition of each of three behavioral phenotypes: compete for prey, be non-interactive, or cooperative. The data collected to date indicates that group capture of prey occurs at a substantial loss to individual fitness, though this cost may be less than that incurred if dispersal were to occur. Evidence for the operation of kin selection is also presented.

POSTSCRIPT ON ARANEISM

Jerry G. WALLS sent in a clipping from the Trenton (NJ) Times for 17 September 1983. It looks like the silliness over araneism continues:

> DANBURY, Texas (AP) - Hundreds of just-hatched black widow spiders escaped from a jar in a classroom and bit at least 20 middle school students. A school official said Friday it's the last time live spiders will be displayed in schools. Ten students at Danbury Middle School were treated for the bites at a hospital, superintendent Keith Swim said. He said six were held overnight and one boy suffered considerable nausea and aching shoulders. The episode began last week when a student found a spider and took it to science teacher Jack Cameron. Swim said Cameron identified the highly poisonous spider by its black body and red belly and put it in a closed jar in his classroom.
>
> But over the weekend, Swim said, eggs the spider had laid hatched and the tiny babies escaped through air holes in the jar's metal lid. The students were bitten Monday. Cameron estimated the spider laid about 400 eggs. Black widow bites can result in respiratory paralysis if not treated. But in most cases victims experience pain at the site of the bite and muscle cramps, said Ron Tisdell, poison information consultant at the Southeast Poison Center in Galveston. Swim said an exterminator was called.

There seem to be at least two things wrong with this report as written. First of all, hatchling Latrodectus do not emerge from the eggsac for about 30 days after the sac has been constructed (personal observations on two species in Virginia). Evidently this spider made an eggsac after being placed in a jar and spiderlings emerged in only a few days. Secondly, newly emerged Latrodectus spiderlings are generally less than a millimeter long, with cheliceral fangs quite incapable of penetrating human skin, and in addition, the minuscule amount of venom that might be injected even if such a bite were physically possible would be far too little to cause any symptoms even in small children.

Sounds like a case of mass hysteria--or something else doing the biting.

MONOTAXOPHILIA

by

Jon REISKIND
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AAS President's Address,
delivered at the
Eastern Section meeting in
Athens, Ohio

As president of one of this country's monotaxophilic organizations I have had cause to contemplate the role of monotaxophilia in science and our society.

I have used this new term "monotaxophilia" both as a noun and as an adjective, so I think I ought to define the term. It means, literally, "the love of a single taxon." But this phenomenon, which sounds almost like a mental disease (and may be) is as powerful as the term "love" implies. Let's look at one monotaxophiliac early in his life:

> "But no pursuit at Cambridge was followed with nearly so much eagerness or gave me so much pleasure as collecting beetles. It was the mere passion for collecting, for I did not dissect them and rarely compared their external characters with published descriptions, but got them named anyhow. I will give proof of my zeal: one day, on tearing off some old bark, I saw two rare beetles and seized one in each hand; then I saw a third and new kind, which I could not bear to lose, so that I popped the one which I held in my right hand into my mouth. Alas it ejected some intensely acrid fluid, which burnt my tongue so that I was forced to spit the beetle out, which was lost, as well as the third one.
>
> "I was very successful in collecting and invented two new methods; I employed a labourer to scrape during the winter, moss off old trees and place [it] in a large bag, and likewise to collect the rubbish at the bottom of the barges in which reeds are brought from the fens, and thus I got some rare species. No poet ever felt more delight at seeing his first poem published than I did at seeing Stephen's "Illustrations of British Insects" magic words, "captured by C. Darwin, Esq."

This enthusiasm and single mindedness is both the strength and weakness of monotaxophilia. With the exception of a natural interest in our own species, Homo sapiens, monotaxophilia is a relatively recent phenomenon, starting with such individuals as BUFFON and LAMARCK. In arachnology we are grateful to the early monotaxophiliac, CLERCK, a tax inspector, for giving spiders the pole position in the world of Linnaen nomenclature. With DARWIN and CLERCK in mind it is interesting to note the inability to distinguish easily between the amateur and the professional in the 18th and 29th centuries. Was DARWIN an amateur or a professional? What in the world did he do for a living? The independently wealthy naturalist is quite rate today, almost everyone having an honest job. But if you truly enjoy your work (as many professional monotaxophiliacs do) is it really "honest?" Is it really "professional?" Well, clearly we have many great naturalists, both amateurs and professionals, for which to be grateful.

I feel the benefits of monotaxophilia far outweigh the drawbacks. As we can see from such meetings as this one and the international congresses, monotaxophilia offers, in its "narrowness", actually a way to broaden communication in science. It is really a way of preserving the very best of the virtues of an interdisciplinary approach without the weaknesses of ignorance due to unfamiliarity with the organisms with which one is working. Paradoxically, in this world of increasing specialization the "narrow" choice of a single taxon for study is actually a way of preserving a wide range of conceptual ideas. Thus the monotaxophile, as a result of his "love" for his or her taxon, will take interest in everything from its biochemistry to its behavior, as we have seen so well demonstrated here in the last two days.

Another benefit of monotaxophilia, especially evident in amateurs, is the extension of their enthusiasm from the organism to the habitat in which it is found and thence to the preservation of that environment. The supporters of such groups as the Nature Conservancy and the Sierra Club are often monotaxophiles--often ornithologists, but also botanists, entomologists, arachnologists, etc.

The vast majority of us, if not all of us, have chosen the study of arachnids as a result of an interest in them that is very difficult to explain to others. We arachnologists are in a special situation since our arachnophilia is in vivid contrast to a widespread arachnophobia. This interest in a group that is almost universally abhorred or at least feared is considered almost a perversion by others. Whether this ubiquitous phobia is genetic, as E. O. WILSON would suggest (i.e., a consequence of selection with regard to an element that was "potentially dangerous in our ancient environment") or environmental is another matter and not appropriate to this talk.

A reflection of the increase in organized monotaxophilia is the number of organizations as well as journals and publications that are devoted to a single taxon. Several ornithological and entomological societies and their journals have been around for more than a century. In arachnology (apart from acarology), the monotaxophilic publication is more recent. For a long time this step-sister of entomology (publishing papers in such entomological journals as "Psyche") finally came into her own with, at present, four major periodicals: "Acta Arachnologica" (1936), "Bulletin of the British Arachnological Society" (1969), "Journal of Arachnology" (1973), and "Revue Arachnologique" (1977). In addition there have been a variety of newsletters which often better reflect the spirit of arachnophilia than the stodgy, more formal journals.

Within the Class Arachnida most arachnologists narrow their interests to an order of lower taxon. Sometimes this natural specialization expresses itself in such groups as the Peckham Society whose publication, "Peckhamia," is devoted solely to salticids. Every formal group requires a sufficient number individuals for a monotaxophilial organization to thrive.

One danger of monotaxophilia is that it may become monotaxomania, an irrational enthusiasm for a single taxon, of the sort that was associated with the genus Ailuropoda, the giant panda, in the 1970's. However I am pleased to see the American Tarantula Society harness the enthusiasm and interest of owners of pet tarantulas and produce an excellent newsletter, "The Tarantula Times," which has had a good series on one of America's outstanding arachnologists--William J. BAERG, as well as many other informative articles.

Let me suggest that we encourage the general public to become monotaxophiles, not necessarily arachnophiles (though that would be nice), thus raising their consciousness of their environment.

In the Kurt VONNEGUT novel, "Slapstick", the last President of the United States proposes that each citizen be made part of "an ideal extended family" by arbitrarily being given middle names (of an animal, plant or element) designating his "family" (for instance, 'Daffodil' or 'Uranium') and thus producing thousands of communities of common interest crossing all classes.

Well, we are all part of a non-arbitrary extended family. Our common relationship is our monotaxophilial interest in arachnids. Arachnology brings us together--Democrats and Republicans, physiologists and ecologists, systematists and behaviorists, amateurs and professionals, cladists and heathens. It allows us to perceive the universe through new eyes (usually 8, sometimes 10, sometimes fewer) with the distortion of a bias but also with the insight and motivation of real interest and concern.

AND NOW, SPIDER FIGHTING

by Nid ANIMA

(transmitted by Chris STARR;
originally published in
"Manila Magazine,"
October 1982)

Spider-fighting should be attributed to the Tagalogs if credit were to be extended where it is due. They are not without a name for it: labanan ng gagamba or sometimes sabong ng gagamba (gagamba meaning spider and laban or sabong for fight). From whatever angle it may be viewed, it is a kid's game, although adults are not forbidden from indulging in it.

The sport has been immortalized by Isabelo CRISOSTOMO in a short story titled, "The Spider."

Spider-fighting was a big craze at the Hacienda Luisita in San Miguel, Tarlac during the mid-70's--thanks to the patronage of sportsman Esting TEOPACO, who used the sport as occasion to distribute bounty among the residents of his hacienda. Held at least once a week, sessions are always festive occasions, if only for the reason that Esting never fails to have a cow butchered just so the guests, composed mostly of farm folks, are assured of a sumptuous feast.

Esting habitually goes on a purchasing binge, buying spiders that cost as much as P25 per head. It goes without saying that his stable of 1,000 warriors spread approximately P25,000 among the residents of Hacienda Luisita who caught the spiders in the first place.

B & C Bishop & Crosby
D & H Dondale & Redner
G & I Gertsch & Ivie
P & P Peckham & Peckham
G & A Gertsch & Archer
W & E Wallace & Exline
G & M Gertsch & Mulaik
L & L Levi & Levi
I & B Ivie & Barrows
C & G Chamberlin & Gertsch
G & P Gertsch & Platnick
M & M Muma & Gertsch
G & J Gertsch & Jellison
P & S Platnick & Shadab
G & D Gertsch & Davis
P & W Peckham & Wheeler
G & R Gertsch & Riechert
C & I Chamberlin & Ivie
G & W Gertsch & Wallace
L & D Lowrie & Dondale
C & B Crosby & Bishop
T, D, & R Turnbull, Dondale & Redner

Glass-topped matchboxes constitute the arena of the spider gladiators, to allow excellent viewing of the matches. Spiders, too, have individual appellations, such as Atoy Co, Adornado, 747, Blue Diamond, Wonder Woman, etc. As to how a particular spider is called really all depends upon the inspiration of its owner.

The Protagonists

Spiders thrive during the wet months, especially June and July, as well as in December and January. The catching occurs at night-break. Catching them at any other time is sheer luck, for spiders don't go roaming around freely at all hours.

There are a number of especially pugnacious species, one of which is identified as gagambang saging (banana spider), a name invariably inspired by the fact that they make the banana plants their abode. Greenish in color, they command a premium price. Experts though observe that the tough fighters are of a brownish color and dwell in guava trees, hence are called gagambang bayabas.

Classifying spiders is a process akin to separating the grain from the chaff or the boys from the men, so to speak. Great fighters are identified by their strong fingers as well as peculiar walking gait. Exactly what this peculiarity is happens to be a trade secret of the experts.

Training a Champion Spider

Spiders are in a class with fighting cocks and horses in the manner of their training for a fight, where meticulous supervision is the rule. The regimen consists of soaking in water one week prior to F(ight)-Day. They are brought out every morning, just so they could relieve themselves.

While their regular diet consists of cow's milk and their own kind, it is different during training when they are instead fed with dragonflies three days prior to the dhowdown. Why, of all things, dragonflies?

By some chemistry as yet unknown to this writer, dragonflies make spiders hungry--exactly the desired condition since spider-fighting is fundamentally an eating contest. An exercise in cannabalism, if you will.

The Fight

The duel transpires on a T-roost of tingting (coconut leaf rib), a material usually used for brooms. Spiders are released on the line where they don't lose any time chasing each other. Should they fall off the line, as they sometimes do, they are caught and placed back on. A spider that falls off twice is automatically declared the loser.

Spiders subscribe to a peculiar way of fighting. Unlike the popular concept of fighting, as in boxing or cock-fighting where the opponents hit each other with either hands or legs or whatever, the spiders' weapon is the saliva, releasing this silky substance once an opponent has been rendered helpless. An attempt to envelope the opponent with saliva is rendered by whoever it is that enjoys the upper hand of the combat. Succeeding thus, it becomes the victor. On the other hand, the vanquished gladiator is suffocated to death as one mummified.

It would seem that spider-fighting is not a matter of skill, fierceness and savagery. Rather, it is more a matter of size. The bigger ones easily, effortlessly, vanquish their smaller foes. Rarely, if ever, has it occurred that a smaller combatant prevailed over a bigger adversary.

A notable peculiarity of spider-fighting is that where in other sports, like boxing and cockfighting, the burden of fighting, is borne by the male specie, in this sport, it is the reverse: the females are the ones who fight. Biology is chiefly responsible for this aberration, nature having endowed the female spider with a pugnacious temperament.

It goes without saying that chauvinism is likewise inverted in the arachnid kingdom. The male spider, known as gagambang kabayo (horse spider) and distinguishable by its extended fingers and lean skeletal frame, gives his all to the female--after mating, the female spider naturally devours her husband.

WHERE IS IT?

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Among the most time consuming tasks in systematic research is that of finding the location of collecting sites. Atlases and automobile maps are handy and most commonly used, but are of little help when the locality is not a town or populated place, or when the place name is no longer used. Names for many physical features (e.g., mountains, streams, farms) can be checked in gazetteers; a superb set of gazetteers exists for the Canadian Provinces and Territories. Many other countries publish similar gazetteers. The United States is unique in having characteristically prepared and published gazetteers for virtually anywhere in the world other than the United States itself.

This is a slight exaggeration: at the turn of the century gazatteers were prepared for several states, but the series was discontinued. Recently the government published a dictionary of Alaska Place Names, and last year a new gazetteer appeared for New Jersey, the first of a new series. Several states have published excellent lists of place names: Arizona, California, North Carolina, Oregon, Virginia, West Virginia, and Wisconsin, to cite a few. There is also a gazetteer of Utah localities published by the University of Utah biology department. Appalachian Mountain Club trail guides have useful indices for mountains, streams and ponds.

Locality names in the West Indies, Central or South America present increased difficulties. Some countries have name lists (e.g., El Salvador); the best of these are probably the U. S. gazetteers. One of the most thorough valumes is that for Cuba.

Historical localities are the most difficult to find. Villages and farms have disappeared, names and spellings have changed (Brazil is a good example), and province delineations have been altered. One of the superb publications for old collecting sites in Mexico and Central America is SELANDER and VAURIE (1962). PETRUNKEVITCH and SIMON have published on their own collecting sites in Latin America. Most useful is a new series started several years ago by

R. PAYNTER of South America. The publications were made for bird collections, but are equally useful for spiders, as several early collectors specialized in both (e.g., K. JELSKI and J. SCTOLCMAN, who collected birds and spiders for TACZANOWSKI in Poland, and of course E. SIMON, who worked on humming birds and spiders. When no birds were available, they devoted their time to spiders). Other old sites listed were favorite haunts of naturalists and collectors. These ornithological publications contain almost all of the old spider localities. Lists for Bolivia, Colombia, Ecuador, Paraguay, Uruguay and Venezuela have been published. The rest are eagerly awaited.

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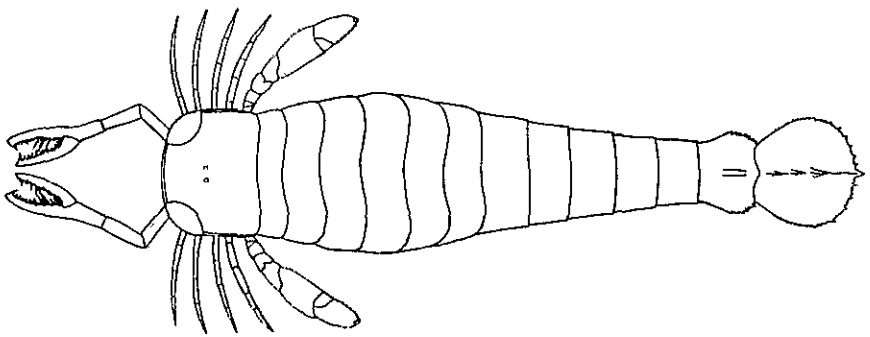

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