FIREFLY

NOTES

PROCEEDINGS OF THE ELEVENTH AND TWELFTH ANNUAL MEETINGS OF THE

TENNESSEE ENTOMOLOGICAL SOCIETY

October 25 - 26, 1984
Henry Horton State Park

October 24 - 25, 1985
Rodeway Inn Music City
Nashville, Tennessee

Volume One

INTRODUCTION

During the 1983 annual meeting the membership expressed a desire to have published a publication containing abstracts of papers given at each annual Tennessee Entomological Society meeting. After collecting the abstracts and beginning the process of putting the publication together it was apparent that there would not be enough material to justify an annual publication. In this light a biennial publication was decided on. Orginally the name was to be "Firefly Proceedings of the Tennessee Entomological Society", but in formulating the cover page the current title came across better.

This is both the societies and my first attempt at putting together a publication such as this and, your comments and suggestion on improving the publication will be appreciated.

Sincerely,

Michael E Cooper

Michael E. Cooper R.P.E
President
Tennessee Entomological Society

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ABSTRACTS OF THE ELEVENTH ANNUAL MEETING
October 25 - 26, 1984

Henry Horton State Park

Possible Vector of Dog Heartworm in Knox Co., Tennessee - Lawrence J. Hribar, UT Knoxville, Tennessee.

Mosquitoes were collected by Magoon trap, Shemanchuk trap, and CO2 baited haematophagous insect traps. Aedes triseriatus, Ae. trivittatus, Ae. vexans, Psorophora ferox, and Culex salinarius were collected in the greatest numbers. Aedes trivittatus was dissected and found to support the development of the parasite to the infective stage. The ability to support development plus the high numbers collected indicate that this species may be an important vector of Dirofilaria immitis in Knox County, Tennessee.

Pathogenesis of Cutaneous Loxoscelism - Dr. Riley S. Rees, M. D.

No Abstract Submitted

Louse Infestations of Tree Shrews and the Host Attachment Mechanism - Lance A. Durden, Vanderbilt University Medical School.

Speculation is made upon the significance of cephalic outgrowths in Sathrax durus a species of sucking lice (Anoplura) normally parasitic on tree shrews (Tupaiidae). An infestation of S. durus on a small laboratory colony of Tupaia glis provided lice for study. While the Cephalic interspine spacing on S. durus could feasibly allow these spines to interlock with host underfur hairs, use in directly gripping host epidermis seems a more plausible function. No host fur was definitely trapped between spines, but attached fragments of host epidermis were common.

Seasonal Patterns of Horse Fly (Diptera: Tabanidae) Population Samples on Berry College Campus, Floyd Co., Georgia - Julia A. Bickel, UT Knoxville, Tennessee, and John W. McDowell, Berry College, Georgia

Study of horse fly species, distribution, and seasonal incidence has been conducted for two years on Berry Campus: Mt. Berry, Ga. Populations of horseflies have been collected in a Townes Malaise trap that has been situated at the same collecting site during both collecting periods. This has enabled a comparison of horsefly species and incidence for two comparable years at the same site. The species with greatest abundance in

both years was Tabanus molestus mixus, making up 37 percent of one seasons collection and 40 percent of the other seasons collection. Incidence of this species was consistent, extending in both seasons from the first week in June until the last week in July, with highest incidence in the first week of July. In both collecting seasons Tabanus molestus mixus, Tabanus fulvulus and Tabanus quinquevittatus could be ranked in the category of the five most abundant species encountered. Tabanus cheliopterus fronti, a late season fly and the second most abundant fly trapped last year, was not encountered this year. Tabanus sulcifrons, the third most abundant fly this season, appears to have a more extended seasonal incidence than observed in the previous trapping season. Studies will continue to further define seasonal patterns and investigate the biology, ecology, and behavior of the Tabanidae.

Mosquito Control in a Northeastern Arkansas Rice-Growing Community - Larry Olson, Arkansas State University.

Rice, as an agricultural crop, was introduced into the United States in 1685. Since that time, Arkansas has become the leading rice-producing state with an estimated 490,000 ha grown in 1984. Waters associated with rice cultivation in NE Arkansas have provided abundant mosquito-breeding sites, particularly for Psorophora columbiae and Anopheles quadrimaculatus.

In response to increased numbers of rice-associated mosquitoes, an organized control program was initiated at Jonesboro, Arkansas in 1974. Larval surveys in natural and artificial breeding sites and mosquito adult surveys utilizing landing-rate counts and standard New Jersey light traps were conducted. Sampling results from 1981-1983 indicated that P. columbiae and A. quadrimaculatus comprised approximately 80 percent of the mosquito population.

The suppression of mosquito larvae in waters within the city has primarily been accomplished through the use of Abate (TM) liquid spray and Altosid (TM) briquets. Ethyl parathion dripped directly into rice fields was attempted on a very limited basis between 1975 and 1978. Efforts to increase public awareness concerning mosquito biology has resulted in improved drainage and elimination of many artificial breeding sites on private and public properties.

Ultra-low volume applications of Cythion (TM) and Mosquitocide 731 (TM) made 2 to 3 times per week with ground-operated cold aerosol generators have been successful in keeping mosquito adults within tolerable limits. Aerial sprayings on Baytes-4 (TM) and Dibrom-14 (TM) have been reluctantly discontinued due to high costs.

Gypsy Moth in Tennessee - Michael E. Cooper, Division of Plant Industries, TDA.

A gypsy moth infestation was first found in Johnson County

Tennessee in 1983, as the result of a cooperative survey program between the Tennessee Department and USDA-APHIS-PPQ. Approximately 664 moths and several dozen egg masses were found. Based on these data a cooperative eradication was carried out in May of 1984 on approximately 12,400 acres. The chemical "Dimilin 25 WP" was used at a rate of two ounces/gallon of water per acre (13,600 acres treated). The biological agent Bacillus thuringiensis ("Thuricide") was used along major streams and in the more heavily populated areas at a rate of 16 BIU's applied in a gallon of water per acre (1200 acres treated). Two applications were made. The first began on May 15 and was completed on May 20. The second was begun on May 24 and completed on May 31. Three turbine helicopters were used. Some of the difficulties encountered were: droplet size calibration and the weather. The droplet size of the Bt was critical because if the larva ate too big a droplet it would quit feeding for several days, and by that time there would be new leaf surface for it to feed on. By making the droplets small enough the larvae would be more likely to ingest, a lethal dose. It took an extra day to get all of the helicopters boom configurations set for a small droplet size (100 - 200 microns). Using such a small droplet size made the weather conditions at the time of application critical. Temperatures above 80 degrees fahrenheit were not suitable for application due to the building of thermals that would not allow the chemical to go down in to the tree canopy. Windy conditions were also a problem. For the most part application could only be made between the hours of 5:30 am and 10:30 am each day.

During the 1984 trapping season approximately 2500 traps were set in a grid pattern averaging from 8 to 16 traps per square mile in the southern half of Johnson County. To date 6500 moths have been caught. It should be pointed out that only a half dozen or so moths have been caught around the eradication zone mentioned above. Those were caught along the borders and are considered to be fly-ins.

The infestation is much larger than previously thought and looks to be about 50,000 acres in size, based on the 1984 trapping information. The situation is currently being evaluated for the feasibility of continued eradication efforts.

Apiculture in Southeast Missouri - Raymond Nabors, University of Missouri Delta Center.

In her six week adult life, a honeybee (Apis mellifera) collects 1/2 ml. of nector. Consequently, it takes 100,000 air miles to gather a kilogram. One kilogram of wax supports 22 kilograms of honey. The hive remains at the nearly the same temperature year round.

In the Mississippi Delta Region of Missouri our major pollen sources are grain sorghum and corn. The major nectar sources are soybeans and cotton. The major honey flow occurs in July and August. Several area crops (Cucurbits) depend heavily on honeybee pollination. The largest beekeeping operations in the

state are in southeast Missouri. Their operations are extensively mechanized. Spliting colonies, feeding, and treatment for foulbrood are always necessary in the spring. Comb honey production is possible with proper management.

Culicoides Attracted to Deer in Cades Cove - Reid R. Gerhardt, U. T. Knoxville,Tennessee.

Culcoides were sampled in Cades Cove, Great Smokey Mountains National Park, between 14 May and 11 October, 1984. Collections were made with deer-baited drop traps. A total of 2639 Culicoides, representing nine species, were collected in August and September. C. obsoletus-sanguasuga and C. guttipennis were present all summer. C. stellifer and C. dilipalpis were collected in late summer. Also collected were C. bickleyi, C. biguttatus, C. spinosus and C. venustus.

Reproductive System Anatomy of Menecles insertus (Say) (Hemiptera: Pentatomidae) with Observations on Chorial Processes - Linda A. Lee and Harvey E. Barton, Arkansas State University.

Gross anatomy of adult male and female reproductive systems of Menecles insertus (Say) (Hemiptera: Pentatomidae) is examined. The male reproductive system consists of a pair of testes, each with 6 individual follicles, paired vasa deferentia, paired seminal vesicles, branching ectadenes and mesadenes, a median ejaculatory bulb and duct. Menecles insertus was found to possess more complex male accessory glands than are generally present in Hemiptera. An ectodermal accessory structure of unknown function was found to arise from the mid-dorsal surface of the posterior portion of the ejaculatory duct. Adult females possess a typical Hemipteran reproductive system with ovaries comprised of 7 teotrophic ovarioles, paired lateral oviducts, a single median oviduct, and a complex spermatheca. Scanning electron microscope studies revealed the chorion to possess fine projections of various heights, with the distal ends being pointed or rounded. Twenty-six irregularly clavate micropylar processes are located on the circumference of the operculum.

Japanese Beetle Traps Efficacy in Eastern Tennessee - Lyle E. Klostermeyer, U. T. Knoxville, Tennessee.

Commercial and homemade Japanese beetle traps were evaluated for relative attractiveness during the summers of 1981 to 1984 in Knox County, Tennessee. Dual lure (food + sex attractant) traps (Bag-a-Bug (TM), Lure N Kill (TM), the Beetle Bagger, and homemade milk jug) caught significantly more beetles than did single (food) lure traps (Ellisco (R), modified USDA APHIS survey, and homemade milk jug). Painting homemade milk jug traps chrome yellow did not increase significantly the catch but the use of a dual lure did. Differential trap capacity affected

catch more than trap or lure type under extremely heavy beetle pressure. Significantly more beetles were caught when the Beetle Buster trap was serviced on Monday, Wednesday, and Friday each week than once every two weeks.

The Termite Detection Dog (TM) in the Pest Control Industry - Joseph K. Harris, Hill-Smith Pest Control.

No Abstract Submitted

Loxoscelism: A Personal Experience - Karen Roecker, Division of Plant Industry, TDA.

My name is Karen G. Roecker and I am employed by the Tennessee Department of Agriculture.

I was an unfortunate victim of the brown recluse spider. I was bitten on the last day of June in 1983. I did not feel the sting of the bite; the only way I knew I had been bitten was, I happened to look down at my upper right arm where I had a bruise and noticed a small grey spot that looked like pencil graphite rubbed on it. When I got to work, Mike Cooper, state entomologist, looked at the area under a microscope and noticed no entrance wounds. By that evening my arm was swollen as big as a water melon and I had a systemic rash over my entire body.

That evening, I went to Donelson Hospital's Emergency Room. I was told by the attending physician to go home and if my arm still bothered me the next day to go to my own doctor.

I went to my doctor the very next day, and he excised the area and give me an I.V. of dexamethasone. At Mike Cooper's suggestion, my doctor contacted Dr. Riley Rees at Vanderbilt Hospital as to the best treatment and Dr. Rees told my doctor to try dapsone and steroids and antibiotics. I took the medication and as the days went by, the area turned black and slowly sloughed off. I was referred to a plastic surgeon for a skin graft. The plastic surgeon had experience with brown recluse damage and we waited until the end of July to do the skin graft (The point being to let all the tissue be sloughed off that was going to). By the end of July it was about impossible to keep a bandage dry over the wound. The skin graft was performed on about the last day of July, 1983 and was successful, probably due to the dapsone, a white blood cell inhibitor, which I took.

I missed about two weeks of work the first of August and then all was back to normal. The skin was taken from my hip and put over the wound. The wound felt like a severe burn just before the skin graft. Most of my problem came from the medication I believe. I suffered total dermal loss in the area of decay. The skin graft looks fine and I have complete use of my arm.

Potential Use of Biocontrol Agents to Suppress Insect Pest Populations - P.L. Lambdin, UT, Knoxville, Tennessee.

Relationships between fecundity, fertility, longevity, and mating may have important practical implications for use of the spined soldier bug, Podisus maculiventris, against the Mexican bean beetle, Epilachna varivestis on snapbeans. Results from these tests suggested no advantages in rearing continuously paired spined soldier bugs in the lab. Fecundity and fertility were not significantly increased as a result of constant exposure, and longevity was significantly reduced. Maintaining females without males (after copulation) required less food. Maintaining insects at higher temperatures, though decreasing lifespans somewhat, allows for less energy input without considerable reduction of progeny. The threat of cannibalism and increased ovarian activity are reduced by minimal paired time. The incidence of infertility, which appeared nearly constant for all pairing times, probably won't be increased as a result of restricted paired time. The fecundity and fertility rates, incidence of infertility, and average lifespans recorded in this study could be utilized to estimate potential production of offspring from a predator colony mass reared at 80 degrees - 86 degrees F, with restricted paired time.

The Soybean-Milo IPM Program from the Scout's Perspective - Randy H. Cate, UT Martin, Tennessee.

No Abstract Submitted

The Effect of the Plant Growth Regulator, PIX(TM) on Bollworm Damage in Cotton - Gary L. Lentz, UT West Tennessee Experiment Station.

The effect of the plant growth regulator, PIX, on bollworm oviposition and damage was investigated in studies at the West Tennessee Experiment Station. PIX was not found to affect bollworm oviposition, boll damage or boll count. Results of these studies were compared to a recent report in which PIX reduced square and boll damage and increased bollworm mortality.

Scouting for Tobacco Insects - Edward E. Burgess, UT Knoxville, Tennessee.

No Abstract Submitted

Acarapis woodi - New Imported Problem for U.S. Beekeepers - Harry E. Williams, UT Knoxville, Tennessee.

The internal, parasitic mite Acarapis woodi has been

detected in six states within the U.S.A. The mite known to occur in India, Europe, Africa, and South America before its recent detection in Texas, Louisiana, Florida, South Dakota, North Dakota and New York. A survey will be conducted to evaluate the current infestation level of this mite in U.S. apiaries. Research is being conducted to establish a legal, effective, control method which can be used in the United States.

"New" Insects Associated with Tobacco Cultivars Selected and Bred for Resistance to Viruses - Charles D. Pless, UT Knoxville, Tennessee.

Breeding lines developed from 'Virvin A Mutant' virus resistance source were evaluated for susceptibility to insect feeding. Lines without sticky trichome exudates were highly susceptible to injury by several non-conventional tobacco insects, especially Lygus lineolaris. Flea beetles were 2-11 times more abundant on exudate-free lines. Aphid colonization ratings averaged from low (GR 107, GR 115) to moderate (GR 131, GR 132) to high (VA 509 = standard). Aphid population size was inversely related to predator activity on each line.

Tennessee Entomological Society
Minutes of the Twelfth Annual Meeting
24 October 1985

The Twelfth Annual Meeting of the Tennessee Entomological Society was called to order by President Charles Pless on October 24, 1985 at the Roadway Inn, Nashville at 8:15 A.M. President Charles Pless thanked the membership and the respective committee for a very successful and enjoyable meeting. Special thanks to the Local Arrangement Committee chaired by Sylvester Davis and Joe Dunn for excellent arrangements; Program committee for a most informative program; Loretta Johnson and Carolyn Schmidt for their assistance in registration; and the secretary/treasurer for his 3 year term. Dr. Harold Bancroft extended an invitation to the membership to attend a Colloquim to be held in February at Memphis State on Biology in the MidSouth. Graduate students can present papers in competition for cash prizes.

Committee Reports

Audit - Mike Cooper: Books are in order.
Constitution - Gary Lentz: No report.
Membership - Carl Brown: Several applications were mailed with no response.
Local Arrangement - Sylvester Davis: Everything went smoothly.
Publicity - No report.
Program - Mike Cooper: If any member knows of a special speaker that would be of interest to the group, please inform the program committee. Dr. Reid Gerhardt reminded the membership that we can compensate speakers.
Prediction and Evaluation - Richard Caron: Two reports wer distributed. Insect Condition Report - 1985 and Prediction and Evaluation Committee Report.
Ad Hoc - No progress made in this area.

Awards - Reid Gerhardt - The following awards were presented:

1. Howard Bryer: Penny Thompson of Davison County - not present.

2. Tennessee Entomologist of the Year: Harry Williams of Extension Entomology and Plant Pathology. Not present.

These awards will be presented with publicity coverage.

Nominating - Bill Shamiyeh: Presented the name of Richard Caron for Secretary/Treasurer and was elected. The names of Harvey Barton, Paris Lambdin, and Elmo Shipp were presented for President-Elect. Dr. Elmo Shipp was elected to the office of President-Elect.

All committee reports were accepted as presented by the membership. The minutes and treasurer report of the 11th Annual Meeting were also accepted.

Old Business

Mike Cooper: suggested that we make a donation to Vanderbilt University for Brown Recluse Research. Motion was passed and the amount to be determined by Executive Committee.
Charles Pless: Program Committee of the 11th Meeting did not receive many abstracts, therefore the proceedings were not published. He suggested that guidelines for abstracts be established by Program and Executive Committees before the 13th Meeting.

Guidelines for the Graduate Student Award should be established by the program committee. Awards will be presented in this category at the 13th Annual Meeting.

New Business

Gary Lentz and Charles Pless: Indicated that the pathologists across the state want to form a Tennessee Association of Plant Pathologists. They are wanting to explore the possibility of meeting at the same time of TES. Possibility of joint sessions.
Discussions:

John Hammett asked if they would join our society.
Paris Lambdin sees no advantage to meeting with any other group.
Joe Dunn stated that they need to organize before approaching other groups. They could meet anytime.
Elmo Shipp stated that the Pathologists would consider themselves a separate entity but are wanting to organize during our meeting. The general feeling of the membership is that we should not affiliate ourselves with any other group.

Mike Cooper the Incoming President was escorted to the podium by Past Presidents Reid Gerhardt, Gary Lentz, Gene Burgess, Carl Brown, Mendell Snodgrass, Harold Bancroft, and Joe Dunn.

President Mike Cooper presiding:

Reid Gerhardt: Award presented to Dr. Charles Pless as outgoing president.
Sylvester Davis: Made a motion that if membership are satisfied with local arrangements, we will meet again at the Roadway Inn and Meeting Time will remain about the same. Motion passed.

The possibility of pre-registration was suggested of knowing how many people will attend future meetings.

The Business meeting of the 12th Annual Meeting of the Tennessee Entomological Society was adjourned at 9:24 A.M.

TREASURER'S REPORT 9/30/85-11/5/85

Balance 10/24/85 Audit			$ 1,849.54
Income 1985 Meeting			
Dues	$ 265.00		
Pins	16.00		
Registration	430.00		
Banquet	312.00		
Breakfast	180.00		
Cash for Change at Meeting	100.00		
TOTAL	$ 1,303.00		3,152.54
Expenses:			
Roadway Inn			
Banquet	$ 460.03		
Breakfast	245.35		
Coffee Break	22.30		
Awards	72.76		
Cash for Meeting	100.00		
Stamps	22.00		
Donation (Vanderbilt)	50.00		
TOTAL	$ 972.44		2,180.10

Pins on Hand = 2

ATTENDANCE ROSTER OF THE 1985 12th ANNUAL MEETING
OF THE TENNESSEE ENTOMOLOGICAL SOCIETY

Member	Affilliation	Location
Alwahab, Allen D.	TN Dept. of Ag.	Nashville, TN
Arnold, Tony L.	American Cyanamid	Holladay, TN
Avery, Jay P.	UT-Student-Ent. & Pl. Path.	Knoxville, TN
Bancroft, Harold R.	Memphis State University	Memphis, TN
Barton, Harvey E.	Arkansas State University	St. Univ., AR
Bogard, James B.	TN Dept. of Ag.	Nashville, TN
Brown, Carl D.	Memphis State University	Memphis, TN
Bruer, H. L.	Retired-TN Dept. of Ag.	Nashville, TN
Burgess, Edward E.	University of Tennessee	Knoxville, TN
Cagle, Jimmy E.	TN Dept. of Ag.	Winchester, TN
Caron, Richard E.	University of Tennessee	Jackson, TN
Cassety, David	Union Carbide	Gainesboro, TN
Clay, Anthony H.	Hill-Smith Systems	Memphis, TN
Cooper, Michael E.	TN Dept. of Ag.	Nashville, TN
Davis, Sylvester	TN Dept. of Ag.	Nashville, TN
Dunn, Joe C.	American Cyanamid	Nashville, TN
Eisler, James I.	TN Dept. of Ag.	McMinnville, TN
El Kassabany, Nader	UT Student-Ent. & Pl. Path.	Knoxville, TN
Gerhardt, Reid R.	University of Tennessee	Knoxville, TN
Hammett, John A.	TN Dept. of Ag.	Nashville, TN
Harris, Joseph K.	Hill-Smith Systems	Memphis, TN
Horton, Jane B.	UT Student-Ent. & Pl. Path.	Knoxville, TN
Kauffman, Bruce W.	TN Dept. of Ag.	Nashville, TN
Keener, James A.	TN Dept. of Ag.	McMinnville, TN
Knight, Martin A.	Hill-Smith Systems	Memphis, TN
Lambdin, Paris L.	University of Tennessee	Knoxville, TN
Lee, E. Keith	FMC Corp.	Hermitage, TN
Lee, Linda A.	Arkansas State University	Summersville,MO
Lentz, Gary L.	University of Tennessee	Jackson, TN
Miles, Gene	University of Tennessee	Dyersburg, TN
Muegge, Mark A.	UT Student	Knoxville, TN
Oliver, Howard Reed Sr.	Freed-Hardeman College	Henderson, TN
Olson, Larry A.	Arkansas State University	State Univ., AR
Ourth, Donal D.	Memphis State University	Memphis, TN
Patrick, Charles R.	University of Tennessee	Jackson, TN
Payne, Jacky R.	Zoecon Corp.	Jonesboro, TN
Pless, Charles D.	University of Tennessee	Knoxville, TN
Root, Daniel S.	UT Student-Ent. & Pl. Path.	Knoxville, TN
Shamiyeh, N. B.	University of Tennessee	Knoxville, TN
Shipp, O. Elmo	Mobay	Collierville,TN
Snodgrass, Mendell	USDA Retired	Concord, TN
Snodgrass, Myrtice L.		Concord, TN
Southards, Carroll J.	University of Tennessee	Knoxville, TN
Trull, Howard J.	Freed-Hardeman College	Linden, TN
Watson, Charles N. Jr.	East TN State Univ.	Johnson City,TN
Watson, Ernest B.	U.S.D.A.	Nashville, TN
Wilson, Dalton L.	USDA-APHIS-PPQ	Brentwood, TN

Late Arrivals (10/25/85)

Cole, Bruce A.	TN Dept. of Ag.	McMinnville,TN
Loucks, Mark V.	USDA-APHIS-PPQ	Hermitage, TN

Tennessee Entomological Society

BOARD OF DIRECTOR MEETING

Carl Brown, Mike Cooper, Charles Pless and N. B. Shamiyeh

Dr. Pless called the meeting to order on October 24, 1985 (11:15 AM) at the Music City Rodeway Inn, Nashville, Tennessee.

1. Graduate Student Award - Board recommends to the constitution committee to have a graduate student award.

2. Penny Thompson of Pegram - Davision County - State 4-H winner in Entomology - Howard Bruer Award

3. Entomologist of Year Award - Harry Williams - U.T. Extension Entomoloy and Plant Pathology.

4. Student Registration - will be waived.

5. Board approved the fees for the 12th Annual Meeting - $5.00 Dues, $10.00 Registration, $8.00 Banquet, $5.00 Breakfast, and $1.00 Student Dues.

Music City Rodeway Inn was approved as the meeting site of the 12th Annual Tennessee Entomological Society.

Board Meeting was adjourned at 11:35 AM.

Tennessee Entomological Society

Executive Board Meeting

Present: Mike Cooper, Richard Caron, Charles Pless, and Charles Patrick.

President Mike Cooper called the meeting to order on October 25, 1985 (9:24 A.M.) at the Music City Rodeway Inn, Nashville, Tennessee.

A $50.00 donation was approved to be given to Vanderbilt University for Venom Research.

All new members were approved.

Dr. Carl Brown and Myrtice Snodgrass were approved as Honorary Members to the Society.

Music City Rodeway Inn was approved as the meeting site of the 1986 Meeting with meeting time in late October.

Board Meeting was adjourned at 9:30 A.M.

ABSTRACTS OF THE TWELFTH ANNUAL MEETING
October 24 - 25, 1985

Roadway Inn Music City

The Systematics of the Tanypodinae (Diptera: Chironomidae) occurring in the Littoral Zone of Bays Mountain Lake, Sullivan County, Tennessee - Mr. Charles N. Watson Jr., East Tennessee State University, Johnson City, Tennessee.

Monthly samples of tanypodine larvae were collected from the littoral zone of Bays Mountain Lake for one year using an Ekman dredge. Additional larvae were collected with a sweep net and reared in the lab. Larvae, pupae and adults were mounted on slides and identified to the lowest level possible with existing keys. Three tribes with five genera and at least ten species were present. Ablabesmyia and Procladius species together accounted for over 90 percent of all tanypodines in monthly samples. Four species of Ablabesmyia were collected. Ablabesmyia parajanta was the most common. Larvae that differed from typical Ablabesmyia in having all the ligula teeth of equal length were reared and proved to be Ablabesmyia janta. Two subgenera of Procladius were present. Procladius (Holotanypus) was represented by large numbers of P. sublettei. Two distinct types of Procladius (Psilotanypus) larvae were collected. They could be distinguished by size and by the shape of the posterior proleg claws. Reared pupae and adults were indistinguishable except by size. Both types keyed to Procladius bellus, giving support suggestions by other workers that P. bellus is actually a complex of several sibling species.

Effectiveness of Natural and Introduced Predators on the Mexican Bean Beetle with an Appraisal of Individual and Synergistic Actions - Ms. Jane Horton, University of Tennessee, Knoxville, Tennessee.

New strategies in pest management seek to delay or prevent the evolution of resistance to insecticides through a variety of new tactics. Biological control is increasingly accepted in pest management as a means of suppressing populations of economically damaging insects through the use of natural enemies. Podisus maculiventris (Say), the spined soldier bug, is a pentatomid predator commonly found in agroecosystems. Successfully reared in the laboratory at the University of Tennessee, it has proved itself promising as a control agent in the field of Mexican bean beetle (Epilachna varivestis Mulsant) larvae on snapbeans. Also, lady beetles (Hippodamia convergens Guerin-Meneville and Coleomegilla maculata fuscilabris (Mulsant)), green lacewings (Chrysopa carnea Stephens), and stilt bugs (Jalysus spinosus (Say) interacted synergistically with P. maculiventris through predation of the pest's eggs, resulting in reduction of the

Mexican bean beetle in all but the adult stage.

An update on Cotton Insect Problems - Dr. Richard E. Caron, University of Tennessee Agricultural Extension Service, Jackson, Tennessee.

The cotton plant attracts a wide variety of arthropod species. Some species of insects and mites damage the crop, while others are beneficial (predators and parasites).

Early-season pests include thrips and tarnished plant bugs. Thrips feed on newly emerging cotton seedlings and cause plant stunting and maturity delays. Tarnished plant bugs feed upon young pinhead sized squares, causing squares to abort from the plant.

Later in the growing season, aphids, whiteflies and spider mites are likely to cause cotton injury. Aphids and whiteflies feed on plant leaves and tender terminals reducing plant vigor and release honeydew upon which sooty mold may grow. Spider mites may develop high populations under persistent hot and dry weather. Under these conditions mites can cause cotton defoliation and yield reduction.

Boll weevils resurfaced this year and caused some economic damage in Hardin and McNairy Counties. Bollworms/tobacco budworms appeared during mid-late August and caused up to 20% square damage in some fields of middle West Tennessee.

The green stink bug was particularly injurious to Tennessee cotton in 1985. Adults and nymphs were found to cause considerable damage to young bolls in July and remained in cotton fields through October.

Numerous predatory arthropods consistently inhabit cotton from year to year. These include big-eyed bugs, minute pirate bugs, lady beetles, and spiders.

Integrated pest management continues to be an acceptable tool in cotton production. This includes the use of pheromone traps, blacklight traps and scouting as means of insect detection, prediction, and pest evaluation.

Lectin-like Agglutination Reactions with Extracts from Insect Galls on Plants - Dr. J.Howard Trull, Freed-Hardeman College, Henderson, Tennessee.

Lectins are generally defined as large protein molecules in plant tissues with the ability to agglutinate red blood cells. Though a few lectins have been isolated from animal tissues, the bulk of lectin research has been limited to those isolated from seeds. This investigation deals with the isolation of lectin-like agglutination of erythrocytes from extracts of insect galls on plants. Numerous plant galls contain agglutinins, however, the ball gall on Smooth Sumac, caused by an aphid, (Melaphis rhois), and an unidentified gall on blackberry leaves gave the strongest agglutinations.

Lectins are used in a great variety of ways in research and are proving to be of interest to cytologist, geneticists, hemotologists, immunologists, etc. Perhaps, plant galls may prove to be a good source for some new lectins.

IGR's and their use in the Pest Control Industry - Mr. Joe Harris, Hill-Smith Systems, Memphis, Tennessee.

IGR's or insect growth regulators are a group of chemicals which are receiving new uses in the pest control industry. IGR's are broken into two groups:

1) chitin synthesis inhibitors
2) juvenile hormone analogs

Juvenile hormone analogs are the main group which are being used by pest control operators throughout the country. Active ingredients include methoprene and hydroprene.

Methoprene prevents insects which have complete metamorphosis from reaching the adult stage. The mode of action of this material is in keeping juvenile hormone levels at higher amounts in the body of the insect when the hormone level should be dropping. Methoprene is available in several formulations for control of fleas, mosquitoes, pharaoh ants, and numerous stored grain insects.

Cockroaches are controlled by hydroprene. This material does not prevent the cockroach from becoming an adult. However, the adult will be abnormal by having twisted wings, darker body coloration with sterilization of males and females occurring. When sterilization occurs successive generations will be eliminated thus leading to long term control.

IGR's are very specific in action. The LD 50 for hydroprene is 34,000 mg/kg acute oral exposure in male rats. These chemicals may also be applied to certain areas which are off limits to conventional pesticides.

Insect growth regulators are new tools which are earning their place in the pest control industry. This concept of controlling pests should be adopted by all professionals as they are very safe for non-target animals and the environment.

Analysis of Esterase III in the Cotton Boll Weevil - Dr. Bobby Jones and Dr. Harold Bancroft, Memphis State University, Memphis,Tennessee.

Polyacrylamide gel electrophoresis was used examine to gut, Malpighian tube, fat body, testes and ovariole tissues of the adult cotton boll weevil, (Anthonomus grandis Boh.) Esterases for which the inheritance has been reported previously by Terranova using whole body homogenates were detected in dissected tissues and the probable physiological function of each allozyme is suggested. EST-1 occurs most frequently in ovarioles and female fat bodies. EST-2 is most often found in fat bodies and may be important in lipid turnover. No sex difference was

observed. EST-3S is found in fat bodies and reproductive tissue while EST-3F is always located in gut tissues indicating that EST-3 is not controlled by a single autosomal locus with two codominant alleles as previously reported. EST-4, the most abundant esterase, can be detected in gut tissue at any age and is probably involved in digestion. EST-5 contains four allozymes which appear most frequently in testes and may be important during reproduction.

Abbreviations used:
EST-1, EST-2, EST-3, EST-4 and EST-5 = esterase enzymes
Est-1, Est-2, Est-3, Est-4 and Est-5 = esterase alleles

Review of the Tabanidae of Tennessee - Dr. Reid R. Gerhardt, University of Tennessee, Knoxville, Tennessee.

There have been 96 species of Tabanidae collected in Tennessee. Thirteen more are probably present in the state, but as yet uncollected. The Tabanidae are represented by three subfamilies, seven tribes and 15 genera. The most common are Chrysops, Hybomitra and Tabanus. The characters used to determine the general and species include wing patterns,, the structures of the head and antennae. Unusual species were discussed and a key to the adult females was distributed.

Blood Meal Digestion in Ticks - Mr. Lewis Coons, Memphis State University, Memphis, Tennessee.

Canceled

A Different Delivery System for Systemic Insecticides - Mr. Woody Woodiel, Woodiel Consulting Service, McMinnville, Tennessee.

Canceled

Life History of the Walnut Scale on Dogwood - Dr. Paris Lambdin, University of Tennessee, Knoxville, Tennessee.

The walnut scale, Quadraspidiotus juglansregiae, was originally described by Comstock (1881) from specimens collected on English walnut, Juglans regia L., in California. This species infests the bark and leaves of over 87 species of fruit and ornamental trees in the United States. Damage to the host is caused by sap extraction which results in loss vigor, dieback, stunting and eventual death of the affected plant.

The walnut scale is a bivoltine species that overwinters as second instar males and females. Females underwent three developmental stages, the mobile crawler stage followed by the sessile second and adult stages. Adults begun emerging in mid-March and late July.

Adult wasps, Prospaltella sp. (Hymenoptera: Eulophidae) parasitized second instars at a rate of 8-17% (n=1200). Females deposited a single egg in the abdominal area of the host. Upon completion of development, the parasite chewed a subcircular hole through the host's exoskelton and test to emerge. Although no direct predation was observed, the lady beetle Chilocorus sp. (Coleoptera: Coccinellidae) and the twice stabbed lady beetle, C. stigma (Say) were commonly found among scale infestations.

Other hosts on which the walnut scale was collected in Tennessee included: Acer saccharinum L. (silver maple), Celtis occidentalis L. (hackberry), Cladrastis lutea Michx. (yellowwood), Ilex crenata Thunb. (holly), Fraxinus americana L. (white ash), Liriodendron tulipifera L. (yellow-poplar), Malus sp. (apple), Prunus caroliniana Mill. (Carolina laurelcherry), Quercus palustris Muenchh. (pin oak).

Edovum puttleri, a New Parasite of the Colorada Potato Beetle, Leptinotarsa decemlineata - Mr. Nader El Kassabany, University of Tennessee, Knoxville, Tennessee.

Edovum puttleri was introduced into the United States in February 1980 by Ben Puttler of the U.S.D.A. Biological Control of Insects Research Unit in Columbia, Mo. from Colombia, South America. In the summer of 1985 longevity and fecundity were determined under laboratory conditions at the University of Tennessee. Longevity was tested at two different temperature regimes and three different diets. In fecundity tests females laid 40.8 $\pm$ 4.8 eggs in her life time.

Seasonal Emergence and Habitat Selection of Some Tennessee Culicoides - Mr. Daniel S. Root and Dr. Reid Gerhardt, University of Tennessee, Knoxville, Tennessee.

Between June and October 1985 Culicoides biguttatus C. stellifer, and C. venustus were collected from wet meadow, and spring and pond margins by aluminum-can emergence traps. Culicoides biguttatus had a single emergence peak in early June and C. stellifer and C. venustus had four synchronous peaks at approximately four week intervals from June to September. Culicoides biguttatus was taken from areas that became extremely dry by August, while C. venustus was only collected from sites that maintained a high degree of wetness. Culicoides stellifer was collected from both types of habitat.

Effects of Insecticide Classes on Cotton Yield and Maturity - Dr. Gary Lentz, University of Tennessee Agricultural Experiment Station, Jackson, Tennessee.

Effects of scheduled applications of different classes of

insecticides on cotton yield, maturity, and gin turnout were studied in 1984-85. Insect populations were generally below threshold levels. Treatment with Pydrin in 1984 produced significantly more lint cotton at first harvest than did Bolstar and EPN-Methyl Parathion, but yield from the untreated check was not significantly different from any treatment. There were no significant yield differences among treatments when both harvests were combined. In 1985, all treatments produced significantly more cotton at first harvest than did the untreated check. A combination treatment of Cygon and Cymbush produced 3580 pounds of seed cotton per acre which was not significantly different from other treatments except Bolstar. Applications of EPN-Methyl Parathion and Bolstar in 1984 delayed maturity compared to other treatments and the untreated check. Gin turnout was not affected by treatment.

Lack of Immunity to Serratia marcescens by Heliothis virescens larvae - Dr. Donald O. Ourth, Memphis State University, Memphis, Tennessee.

Serratia marcescens is a bacterial insect pathogen, and Heliothis virescens is an insect pest of cotton and other crops. No bactericidal humoral immunity to S. marcescens could be detected in cell-free hemolymph from 5th instar Heliothis larvae. This was true for hemolymph obtained from un-inoculated larvae and for hemolymph from inoculated larvae at 24 hours post-inoculation of heat-killed S. marcescens. C-Reactive protein, an inflammatory protein, was demonstrated only in hemolymph from inoculated larvae. Only 20% difference in phenoloxidase activity was found between hemolymphs obtained from uninoculated and inoculated larvae, again indicating lack of immunity and perhaps lack of larval recognition of S. marcescens. Oral infection of larvae with S. marcescens increased larval death 17 times when comparing uninfected larvae (1.1% dead) with infected larvae (18.5% dead).

Coccophagus lycimnia (Hymenoptera: Aphelinidae): A Potential Biocontrol Agent of the Brown Soft Scale, Coccus hesperidum (Homoptera: Coccidae) - Mr. Mark Mugge, University of Tennessee, Knoxville, Tennessee.

Longevity of Coccophagus lycimnia was evaluated at 17, 22, 27 degrees C, each determined with honey, water, honey and water. Both sexes lived longest at 17 degrees C with honey and water and shortest at 27 degrees C with water. The impact of the parasite on the brown soft scale was evaluated. Of 1,700 scales counted 5.6% were living, 44.7% died from parasitism, and 49.7% died of other factors. Additional studies on the life history and development of the parasite indicate that Coccophagus lycimnia is a potential biocontrol agent of the brown soft scale.

Update on the Tennessee Gypsy Moth Situation - Mr. Michael E. Cooper, Tennessee Department of Agriculture, Nashville, Tennessee.

The first established infestation of the gypsy moth in Tennessee was discovered in the summer of 1983, after an intensive trapping program had been carried out in East Tennessee. That program was an attempt to locate any small infestations that might have resulted from the increased flow of tourists, out of the Northeast to the World's Fair in Knoxville, and the Great Smoky Mountain National Park, during 1982.

The infestation was found in the southern portion of Johnson County, between Watauga Lake and Mountain City, and was not the result of World's Fair traffic into the State. Over 600 moths were caught. Those 600 moths represented four times the total number of moths caught in the entire State during the previous 12 years.

In the fall of 1983 Tennessee Department of Agriculture Division of Plant Industries and USDA employees conducted a survey of the area and found several dozen egg masses in two locations. The presence of two life stages, the moth and the egg, confirmed the existence of the infestation. That winter, plans were made to treat approximately 14,000 acres around the two egg mass locations. The spray project was successful, but that success was muted by the fact that the summer trapping program showed the infestation to be about five to six times larger than was originally thought, with over 6,600 moths being caught.

During the fall of 1984, plans were made to treat a larger area. This time, there would be 47,000 acres treated including a small portion of the 1984 treatment area where the boundaries met. To treat an area this size, larger aircraft were used including a DC-3 and three Twin Beech aircraft. This project was completed in the same time frame as the 1984 project was, with the unpredictable nature of the weather in the mountains again stretching the spray program from a two to a three week job.

The number of moths trapped was much lower in the summer of 1985, with only 36 moths being caught in the entire county, with no moths being caught in the treatment area. In fact, the nearest trap catch was a half a mile away. Three-quarters of Johnson County and parts of two adjacent counties were trapped in 1985 this area will be expanded to include all of Johnson County during the 1986 season. Trapping has been carried out at a rate of nine per square mile in 1985 and that rate will be continued through the 1986 season. Trapping will continue for the next several years to insure that the main infestation has been eradicated, and to locate any small outlying infestations that might require treating. But to date, none have been found.

TENNESSEE ENTOMOLOGICAL SOCIETY
MINUTES OF THE ELEVENTH ANNUAL MEETING
26 OCTOBER 1984

The Eleventh Annual Meeting of the Tennessee Entomological Society was called to order by President Carl Brown on October 26, 1985. Dr. Brown thanked Mike Cooper and his local arrangement committee for a job well-done. He also thanked Dr. Charles Pless and his program committee for an excellent program. Georgia Trotter and Loretta Johnson were also thanked for their continued help and support during registration. Minutes of the 10th Annual Meeting and the treasurer's report were approved by the membership.

Committee Reports

1. Audit: John Hammet stated that the treasurer's books were in order.
2. Constitution: Dr. Southards stated that there were no changes proposed.
3. Membership: No report given.
4. Local Arrangement: Mike Cooper stated that the facilities were adequate.
5. Publicity: Harry Williams stated that one news release was submitted.
6. Awards: Joe Dunn stated that no special awards were brought to the attention of the committee.
7. Program: Charles Pless stated that there were 15 submitted and 3 invitational papers. The program covered all aspects of Entomology. He wanted input from membership on the type of future programs. He also requested abstracts from the speakers.
8. Prediction and Evaluation: Dr. Richard Caron presented a report in two forms: Insect Conditions Report 1984 and Prediction and Evaluation Committee Report.
9. Nominating: Dr. Reid Gerhardt presented the names of Mike Cooper (TN Dept. of Ag.) and Dr. Harvey Barton (Arkansas State University) in nomination for president-elect. Nominees were approved and Mike Cooper won the election.

OLD BUSINESS:

Joe Dunn wanted the Board of Directors to consider a graduate student award similar to the ones awarded by ESA.

NEW BUSINESS:

Joe Dunn wanted the Board of Directors to consider the student registration fees and make a decision to be included in the constitution.

Lyle Klostermyer made a motion that the proceedings of TES should be titled "Firefly Proceedings of the Tennessee Entomological Society". Motion was passed.

Meeting Time for Future Meetings:

Neil Woodiel wanted to consolidate our meeting with TACA thus changing the time.

Mr. Snodgrass opposed the joint meeting with TACA.

Gary Lentz - Late October is suitable for most people, some people have difficulty making the TACA meeting.

Joe Dunn - was opposed to a joint meeting.

A vote by the membership indicated that the meeting time should stay the same.

Location of Future Meetings:

It was decided that the meeting site and location would be determined by the Local Arrangement Committee pending approval of the Board of Directors. The general feeling of the membership was that we should meet somewhere around Nashville.

New President

Past Presidents Lentz, Vanlandingham, Gerhardt, and Snodgrass escorted President-Elect Pless to receive the gavel and start his duties as the new president.

Dr. Pless awarded Dr.Carl Brown a plaque in appreciation for his work as president and a job well-done. The business meeting was adjourned 9:00 a.m. October 26, 1984.

MINUTES OF THE SPECIAL BOARD MEETING
OCTOBER 26, 1984

President Charles Pless called the meeting of the Board of Directors to order at 9:04 a.m. October 26, 1984. Members present were: Mike Cooper, Charles Pless, Charles Patrick, Carl Brown, and Bill Shamiyeh.

The Board approved the acceptance of 4 new student members and 4 new regular members. It was suggested that the Board meet twice a year; once in the spring and once in late summer. The Local Arrangement Committee will make arrangements to find and reserve a meeting site for the 1985 meeting. The meeting was adjourned at 9:16 a.m. on October 26, 1984.

Respectfully submitted,

N. B. Shamiyeh
Sec.-Tres. TES

TREASURER"S REPORT 10/16/84 - 9/30/85

1984 Post Audit Balance:		$ 1,422.95
Income 1984 Meeting		
Dues	$ 260.00	
Pins	16.00	
Registration	384.00	
Sustaining Membership	50.00	
Banquet	360.00	
Breakfast	156.00	
Cash for Change at Meeting	100.00	
TOTAL	$ 1,326.00	$ 2,748.95
Expenses:		
Henry Horton Inn 50 Dinners & 43 Breakfasts	$ 584.20	
Room for Trotter & Johnson	47.41	
Larry Olson (Honorarium)	100.00	
Karen Roecker Expenses	25.00	
Joe Dunn (Awards)	20.80	
Cash for 1984 Meeting	100.00	
Postmaster-Stamps (8/28/85)	22.00	
TOTAL	$ 899.00	
BALANCE 9/30/85		$ 1,849.54

Pins on Hand 4

Respectfully submitted,

N. B. Shamiyeh
Sec.-Tres. TES

ATTENDANCE ROSTER OF THE 1984 11th ANNUAL MEETING
OF THE TENNESSEE ENTOMOLOGICAL SOCIETY

Member	Affilliation	Location
Alwahab, Allen D.	TN Dept. of Ag.	Nashville, TN
Arnold, Tony L.	American Cyanamid	Holladay, TN
Barton, Harvey E.	Arkansas State University	St. Univ., AR
Bickel, Julia Ann	UT-Student	Knoxville, TN
Biggers, Charles J.	Memphis State University	Memphis, TN
Bogard, James B.	TN Dept. of Ag.	Nashville, TN
Brown, Carl D.	Memphis State University	Memphis, TN
Burgess, Edward E.	University of Tennessee	Knoxville, TN
Cagle, Jimmy E.	TN Dept. of Ag.	Winchester, TN
Caron, Richard E.	University of Tennessee	Jackson, TN
Cassety, David	Union Carbide	Gainesboro, TN
Cate, Randy H.	University of Tennessee	Martin, TN
Clay, Anthony H.	Hill-Smith Systems	Memphis, TN
Cole, Bruce A.	TN Dept. of Ag.	McMinnville, Tn
Cooper, Michael E.	TN Dept. of Ag.	Nashville, TN
Davis, Sylvester	TN Dept. of Ag.	Nashville, TN
Dersch, Louis H.	TN Dept. of Ag.	Jackson, TN
Dunn, Joe C.	American Cyanamid	Nashville, TN
Durden, Lance A.	Vanderbilt University	Nashville, TN
Eisler, James I.	TN Dept. of Ag.	McMinnville, TN
El Kassabany, Nader	UT Student	Knoxville, TN
Gerhardt, Reid R.	University of Tennessee	Knoxville, TN
Hadden, Charles H.	University of Tennessee	Knoxville, TN
Hammett, John A.	TN Dept. of Ag.	Nashville, TN
Harris, Joseph K.	Hill-Smith Systems	Memphis, TN
Howard, Amy J.	FMC Corporation	W. Memphis, AR
Hribar, Lawerence J.	UT Student	Knoxville, TN
Kauffman, Bruce W.	TN Dept. of Ag.	Nashville, TN
Keener, James A.	TN Dept. of Ag.	McMinnville, TN
Klostermeyer, Lyle E.	University of Tennessee	Knoxville, TN
Knight, Martin A.	Hill-Smith Systems	Memphis, TN
Lambdin, Paris L.	University of Tennessee	Knoxville, TN
Lee, Linda A.	Arkansas State University	Summersville,MO
Lentz, Gary L.	University of Tennessee	Jackson, TN
Maslowski, Clarence	UT Student	Knoxville, TN
Miles, Gene	University of Tennessee	Dyersburg, TN
Mitchell, David N.	Hill-Smith Systems	Nashville, TN
Muegge, Mark A.	UT Student	Knoxville, TN
Nabors, Ray A.	University of Missouri	Portageville,MO
Olson, Larry A.	Arkansas State University	State Univ., AR
Oswalt, Dave P.	Cook's Pest Control	Nashville, TN
Patrick, Charles R.	University of Tennessee	Jackson, TN
Pless, Charles D.	University of Tennessee	Knoxville, TN

Reed, Oliver Howard Sr.	Freed-Hardeman College	Henderson, TN
Shamiyeh, N. B.	University of Tennessee	Knoxville, TN
Snodgrass, Mendell	USDA Retired	Concord, TN
Snodgrass, Myrtice L.		Concord, TN
Southards, Carroll J.	University of Tennessee	Knoxville, TN
Trull, Howard J.	Freed-Hardeman College	Linden, TN
Watson, Ernest B.	U.S.D.A.	Nashville, TN
Williams, Harry E.	University of Tennessee	Knoxville, TN
Woodiel, Neil L.	Woodiel's Consulting Svc.	McMinnville, TN
VanLandingham, William	Wight Nurseries Inc.	Franklin, TN

CONSTITUTION

of the

TENNESSEE ENTOMOLOGICAL SOCIETY

Article 1. Name

This Society is formed in the name and style of the "Tennessee Entomological Society", as an educational institution, not contemplating financial gain or profit. It is herein and after called the Society.

Article 2. Purpose

The purpose and object of the Society is to foster entomological accomplishment among its members and to promote the welfare of all the State of Tennessee through the encouragement of: (1) the preparation, reading, and/or publication of papers, (2) association and free discussion among all members, (3) the dissemination of entomological information the general public, and (4) cooperative efforts in statewide insect surveys.

Article 3. Membership

Section 1. Original Members: Any person designated at the organizational meeting of the Society to occupy the status of "Member" shall be considered as and be a Charter Member. Thereafter, the organizational membership shall have no authority to name or appoint members of the Society.

Section 2. Membership: Membership shall be open to all persons interested in Entomology.

Section 3. Sustaining Membership: Sustaining Membership is open to commercial or industrial organizations upon meeting approval and requirements of the Board of Directors.

Section 4. Honorary Membership: Honorary Members may be selected from time to time by a majority vote of the Board of Directors.

Section 5. Student Membership: Student Membership is open to students enrolled in any education institution and meeting the requirements of the Board of Directors.

Section 6. Procedure to Obtain Membership: Any person desiring to become a member of the Society shall do so by application and payment of dues to the Secretary-Treasurer. After approval of the majority of the Board of Directors, said applicant shall become a duly constituted member.

Section 7. Members in Good Standing: A member who is current in payment of dues.

Article 4. Membership Rights

Section 1. Voting: Each member in good standing shall be entitled to one vote at any regular or special meeting or by mail. Voting by proxy shall not be allowed.

Section 2. Privileges: All members in good standing shall have equal privileges in the presentation of papers and discussions at meetings.

Article 5. Membership Certificates

Section 1. Certificates: The Board of Directors shall decide upon what evidence of membership each member in good standing shall be entitled to receive.

Section 2. Transfer: Evidence of membership in the Society will not be transferable or assignable.

Article 6. Dues

Section 1. Annual Dues: The amount of the annual dues for membeship in the Society will be established by the Board of Directors from time to time. The use or uses of dues collected shall also be determined by the Board.

Section 2. Time of Payment: The Board of Directors shall set such times during each year as it deems advisable for the payment of annual dues by members. Generally, annual dues shall be paid during registration at the annual meetings. However, a member may mail dues to the Secretary-Treasurer of the Society if the member cannot attend a given annual meeting. If a member fails to attend an annual meeting and also does not pay dues that year, such member shall be required to pay back dues for the year missed in addition to the currect year's dues in order to be in good standing. If a member fails to pay dues two (2) years in a row, such member shall be dropped from the rolls and shall have no further rights, title or interest in the Society.

Section 3. Honorary Members: There shall be no dues required for Honorary Members or others specially designated by the Board of Directors.

Article 7. Meetings of the Society

Section 1. Annual Meetings: The Society shall hold annual

meetings at such times and places as may be designated by the Board of Directors and specified in the notice thereof, for the election of officers and any other business as may be properly brought before the meeting.

Section 2. Registration Fee: A registration fee, in the amount to be determined by the Board of Directors, shall be paid at each annual meeting by all members and non-members who attend. The Board of Directors will determine the use of these fees.

Section 3. Special Meetings: Special meetings of the Society shall be held at any time and place as specified in the notice thereof whenever called by the President or any two (2) or more members of the Board of Directors.

Section 4. Notice: Notice of all meetings of the Society, annual or special, stating time, place, and agenda shall be mailed to each member by the President, Secretary-Treasurer, or Directors calling the meeting not less than seven (7) days prior to the meeting.

Article 8. Officers

Section 1. Officers: The officers of the Society shall consist of a President, President-elect, Secretary-Treasurer, and Historian, all of whom, except the President, shall be elected by and from the membership by a majority vote of members or by mail. The first President of the Society shall be elected by and from the membership at the organizational meetings for a term extending to the beginning of the first annual meeting. Thenceforth, the President-Elect shall automatically accede to the Office of President at each annual meeting, or when the President is unable or unwilling to act for any reason. Nominees for each elective office of the Society shall be selected by a nominating committee of three (3) members appointed at the annual meeting by the President. Nominations may also be presented from the floor. The President and President-Elect shall hold office from the date of election at the annual meeting until the election of their successors at the next annual meeting, and shall not be eligible for re-election to the same office for a successive term. The Secretary-Treasurer shall hold office from the date of election at the annual meeting until the election of a successor at the third following annual meeting and shall be eligible for re-election. The Historian shall hold office from the date of election at the annual meeting until the election of a successor at the fifth following annual meeting and shall be eligible for re-election. No member shall occupy more than one office at any one time.

Section 2. Duties and Powers of the President: The President shall be the Chief Executive Officer of the Society and shall preside at all meetings of the Society and the Board of Directors, have and exercise general and active management of the Society, execute and enforce all orders and resolutions and

regulations duly adopted by the Board of Directors, execute all contracts in the name of the Society, and perform such other duties as assigned by the Board of Directors.

Section 3. Duties and Powers of the President-Elect: In the absence of the President, or in the case of failure to act, the President-Elect shall have all the powers of the President and shall perform such other duties as shall be imposed by the Board of Directors from time to time.

Section 4. Duties and Powers of the Secretary-Treasurer: The Secretary-Treasurer shall attend and keep the minutes of all meetings of the Board of Directors and the Society, shall have charge of the records and seal of the Society, and shall, in general, perform all the duties incident to the office of Secretary-Treasurer of the Society. The Secretary-Treasurer shall keep full and accurate accounts of the books of the Society and shall deposit all monies and the valuable properties and effects in the name of and to the credit of the Society in such depository of depositories as may be designated by the Board of Directors. The Secretary-Treasurer shall disperse funds as may be ordered by the Board, getting proper receipts for such disbursements; and shall render to the Board of Directors whenever required by it, an accounting of all transactions as Secretary-Treasurer. During each annual meeting, the Secretary-Treasurer shall give a report on the annual financial condition of the Society.

Section 5. Duties and Powers of the Historian: The Historian shall maintain and be responsible for keeping a complete and accurate history of the activities of the Society from year to year.

Section 6. Vacancies in Office: Any vacancy in the office of President-Elect, Secretary-Treasurer, or Historian, however occasioned, may be filled, pending the election of a successor by the Society, by a majority vote of the remaining Directors. Should an office be filled by vote of the Board of Directors, the person so elected shall become the officer upon the next annual meeting unless elected as such by the Society according to the procedures set forth for the election of officers of the Society in Article 8, Section 1, of this Constitution.

Article 9. Board of Directors

Section 1. Makeup and Responsibilities: The Board of Directors shall consist of the immediate past-President, the President, President-Elect, Secretary-Treasurer, and Historian of the Society. Any three (3) Directors shall constitute a quorum for the transaction of business. All properties, property rights, objects and purposes of the Society shall be managed, promoted, and regulated generally by the Board of Directors.

Section 2. Installation and Term of Office: The members of the

Board of Directors shall be installed after their election as officers of the Society as set forth in Article 8, Section 1, of this Constitution, at the annual meeting of the Society, or at any adjourned meeting, or at any special meeting called for that purpose. All installed Directors shall serve for a term corresponding to that of the office in the Society to which each was elected by the members and thereafter until their successors are elected, accept office, and are installed.

Section 3. Annual Meetings: The Board of Directors shall meet immediately after the adjournment of the annual meeting of the members for the transaction of such business as may come before the Board. No notice of such meeting shall be required, and should a majority of the newly-elected Directors fail to be present, those present may adjourn, without further notice to a specified future time.

Section 4. Other Meetings: The Board of Directors shall not be required by this Constitution to hold regular meetings but may, by resolution or otherwise, establish such order of meetings as it deems desirable. Special meetings of the Board shall be held at any time at such places as may be specified in the notice thereof, whenever called by the President or any two (2) or more Directors.

Section 5. Notice: Notice of all meetings of the Board of Directors, other than the annual meeting, starting time, place, and agenda for which the meeting was called, shall be given to each Director by the President or Directors calling the meeting not less than three (3) days prior to the meeting.

Section 6. Vacancies in Board of Directors: Any vacancy in the office of any Director, however occasioned, may be filled, pending the election of a successor by the Society, by a majority vote of the remaining Directors.

Article 10. Miscellaneous Provisions

Section 1. All checks and drafts shall be signed in such manner as the Board of Directors may from time to time determine.

Section 2. At all duly constituted meetings of the Society or Board of Directors of the Society, 10% of the eligible members, of 3 Directors, respectively, present shall constitute a quorum for the transaction of any business presented at such meetings.

Section 3. All notices required to be given by this Constitution relative to any regular or special meeting of the Society or the Board of Directors may be waived by the Directors or members entitled to such notice, either before or on the date of the meeting and shall be deemed equivalent thereto. Attendance at any meeting of the Society of the Board of Directors shall be deemed a waiver of notice thereof.

Section 4. General Prohibitions: Nothwithstanding any provision of this Constitution and By-Laws which might be susceptible to a contrary construction. A. No part of the activities of the Society shall consist of carrying on propoganda, or otherwise attempting to influence legislation. B. This Society shall not participate in, or intervene in, (including the publishing or distribution of statements), any political campaign on behalf of a candidate for public office.

Article 11. Amendments

Section 1. This Constitution may be altered or amended or By-Laws adopted by a majority vote of the quorum present at any annual or special meeting of the Society membership, provided that notice of such proposed amendment or By-Laws shall have been given to the membership prior to the meeting.

TENNESSEE ENTOMOLOGICAL SOCIETY
Active Membership List
(As of October 1985)

Allen David Al-Wahab
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