Greetings from the Department of Entomology and Plant Pathology

Dr. Phil Mulder, Department Head

Welcome to the fourth edition of our annual newsletter. We experienced another great year in the Department of Entomology and Plant Pathology at Oklahoma State University. I want to continue to focus on annual highlights and other activities within the department. We encourage everyone to go on-line to view our newest issue. In this section, I would like to provide you with some 2019 highlights from our department. As always, we had a number of awards and honors gathered by our faculty, students, and staff. In addition, our faculty and students were highly productive in the number of refereed publications and grants awarded.

In spite of declining undergraduate enrollment across the university, we continue growth in our entomology undergraduate major, with nearly 70 majors (which includes about 8 double majors). We are still one of only 16 entomology majors in the country, and currently stand at first or second in the nation for undergraduate enrollment. I should point out that we are doing this with less entomology faculty members compared to the other institutions with a major in entomology (Nationwide average 23.3, we have 10 tenure track faculty in entomology). This fall, we experienced the 7th consecutive year of double-digit enrollment (19 freshmen and 8 transfer students). While our bioforensics option has attracted many majors in entomology this year (7), the Pre-medical/Pre-Veterinary, and the Insect Biology and Ecology option also kept a similar pace. The latter, also attracted 7 new transfers. I believe this is attributable to the work of Drs. Hoback and Shufran in telling the story about the flexibility in job opportunities with an entomology degree. Some of our student’s successfully graduated and entered Veterinary School or Medical school. In spring 2019, two of our graduates ended up in Vet School and at least one ended up in Medical School. In the 2018/19 academic year, we graduated seven undergraduate majors.

Dr. Hoback continues to mentor several undergraduate students, teaching nearly 900 students in “Insects and Society”, producing his online textbook (generating scholarship funds to further support students), and teaches an online offering of Insects and Society to 125+ students each summer. We rolled out our second on line course this fall by Dr. Justin Talley, entitled “Livestock Entomology”.

He currently has 138 students in the first on line offering. I believe this is a testament to the teaching prowess of these two great instructors.

This fall, in conjunction with the Department of Agricultural Education, Communications and Leadership, we honored Dr. Tererai Trent. Tererai is a Distinguished Alumnus. She received this award from the Division of Agricultural Sciences and Natural Resources (DASNR). Tererai founded Tererai Trent International and with an award of $1.5 million built and/or rebuilt 11 schools in Zimbabwe, Africa. More on this distinction will be provided later in this newsletter.

Our graduate student numbers, similar to nearly everywhere, are down this year, likely indicative of our lower faculty numbers. In spite of fewer faculty our curriculum has continued to evolve, thanks in large part to our very dedicated team of faculty. Obviously, the budget often dictates these situations, but the faculty have stepped up and filled gaps in order to provide a diverse number of courses throughout the department. We continue to seek ways to build in flexibility to our degree programs, particularly for graduate education. Our faculty are extremely creative and innovative in developing alternate ways of addressing curriculum issues and I am optimistic and very excited for the future developments that will arise.

In the arena of research, we continue to emphasize the land-grant mission with very active programs in biochemistry, molecular biology, human and animal health, microbial forensics, food safety, insect borne transmission of diseases, diagnostics development, IPM, invasive species monitoring, resistance management, cultivar
development and screening, soil-borne plant diseases, mycology, bacteriology, plant disease epidemiology, efficacy trials, insect and plant disease biology and ecology, biological control, alternative pest control, stored product management, worker safety, conservation entomology, endangered species, termite pre- and post-treatment strategies, bed bug management/demonstration, and pesticide safety education and certification.

This year, I asked Dr. Carla Garzon, Dr. Bruce Noden, and Mr. Edmond Bonjour to provide some highlights from their various areas of research, extension, teaching, and outreach. In addition, Dr. Kitty Cardwell, Professor and Director of the National Institute of Microbial Forensics, Food and Agricultural Biosecurity will let us know about some exciting work being conducted in that arena. In the “Where are they Now” segment I had the opportunity to interview two of our graduates in entomology and one from plant pathology. Mr. Sterrett Robertson and Dr. John Krolak from entomology and from the plant pathology discipline I visited with Dr. Francisco Flores, a 2010 M.S. and 2014 Ph.D. graduate who now works for ESPE in the country of Ecuador. The two entomologists are retired now, but Dr. Flores is very active in research and teaching.

For 2019, a BIG CONGRATULATIONS to Drs. Francisco Ochoa Corona, George Opit, and Carla Garzon who were promoted to Professor. In addition, Drs. Wyatt Hoback and Bruce Noden were tenured and promoted to Associate Professor. Great Job by five very valuable faculty members. Very proud of all these great folks and the wonderful contributions they continue to make to our department!

Research Highlights and Projects

Carla D. Garzon, Ph.D.
Professor of Plant Pathology

In 2008, I joined the Department of Entomology and Plant Pathology (EPP) as an Assistant Professor of Plant Pathology with a 20% teaching – 80% research appointment, focused on soil-borne diseases. I was promoted to Associate Professor in 2014 and to full Professor in 2019. I teach introductory plant pathology courses for undergraduate (PLP 3343) and graduate (PLP 5343) students, and graduate level courses on scientific presentations (PLP/ENTO 5870) and soil-borne plant diseases (PLP 6303). Periodically, I teach special problems courses in population genetics of plant pathogens and soil-borne plant pathogens, and have facilitated courses on diagnosis of plant diseases and insect pests lectured by Jen Olson, Director of the Plant Disease and Insect Diagnostic Laboratory (PDIDL) and Charles Konemann, EPP Insect Collection Curator. All of these courses have consistently received excellent student reviews.

My research program studies plant pathogenic fungi oomycetes (fungus-like organisms) present in soil around roots and the crown area, within the scope of four main research areas: molecular identification and diagnostics, population biology, phylogenetics, and disease management. We use multiple basic and applied approaches to address the challenges to crop productivity that Oklahoma growers face. Since I do not have an extension, I collaborate with extension specialists in Oklahoma and other states to align the efforts of my research program with the goals of OSU, a research institution with a strong commitment to the land-grant mission. I have established fruitful collaborations with OSU researchers and colleagues in other states with expertise on peanuts, cotton, alfalfa, turfgrass, grapes and ornamental crops. I also have established collaborations with colleagues abroad to work on vegetable and fruit diseases. In the past 11 years, I have attracted funding amounting to more than two million dollars, and I have established research projects focused on development and validation of methods for detection and genetic characterization of plant pathogenic using PCR and metagenomic approaches, population structure, population dynamics and systematics of oomycetes and fungi, disease suppression in agricultural soils, and chemical control. I have pioneered the study of hormetic effects (high-dose suppression/low-dose stimulation) of subinhibitory doses of fungicides on oomycetes and fungi, introducing the concept of hormesis to the phytopathological community for the first time, and publishing groundbreaking studies that have provided standardized microbiological and statistical protocols for fungicide hormesis research. I also have an active collaboration with the National Institute for Microbial Forensics and Food and Agricultural Biosecurity (NIMFFAB), focused on development of next-generation sequencing (NGS) based detection of plant pathogens from metagenomics data using the e-probe based nucleic acid detection assay (EDNA) pipeline and the Microbe Finder (MiFi) interphase, with emphasis on oomycetes.

I currently have two PhD and two MS graduate students: Fernanda Proaño (PhD) is conducting research on metagenomic diagnostics of selected oomycete pathogens, the phylogenomics of the Globisporangium (Pythium) irregulare species complex, and the population biology of G. cryptoturgidum in ornamental crops; Felipe Cevallos is conducting research on metagenomic diagnostics of selected oomycetes, with emphasis on regulated species,
fungicide resistance incidence and management in oomycete and fungal pathogens of grapes, including Plasmopara viticola and Phomopsis viticola; Viviana Freire (MS) conducts research on fungicide hormesis in fungal pathogens of onions and grapes in vitro and in plant tissues, with emphasis on gene expression during stimulatory responses to subinhibitory doses of fungicides in Fusarium spp. and Botrytis spp.; finally, Patricia Calderon (MS) conducts research on the incidence of fungicide resistance and hormesis in fungal pathogens of grapes, with emphasis on Guignardia bidwellii.

I currently collaborate with Becky Carroll, Associate Extension Specialist in Horticulture and Landscape Architecture, and Jen Olson, PDIDLE director, in the characterization of diversity, fungicide resistance and hormesis in fungal pathogens of grapes in Oklahoma. I maintain collaborations in Ecuador with colleagues at Universidad de las Fuerzas Armadas ESPE, Pontificia Universidad Catolica del Ecuador and Universidad Tecnologica Equinoccial, in Colombia at Universidad Francisco de Paula Santander, and in Brazil at Universidade Federal de Pernambuco. These collaborations offer research and teaching opportunities for me, my students and EPP colleagues. As part of these collaborations with international universities, I coordinate undergraduate exchange programs with some of these institutions, which provide undergraduate research opportunities at OSU and abroad. International collaborative efforts have produced numerous scientific publications, as well as invited lectures and seminars. I have authored and coauthored 29 published scientific articles, three book chapters, and 15 extension publications. Recent research publications (2019) focused on PCR based diagnostics and fungicide hormesis in fungal pathogens of turfgrasses in collaboration with Dr. Nathan Walker and Dr. Hassan Melouk, as well a first disease report in golden berries in Ecuador in collaboration with Prof. Jennifer Yanez. Currently, I serve as member of the Oomycete subject matter committee and chair the Pythium taxonomy sub-committee of the International Society for Plant Pathology (ISPP). I am a Board Member of the Office of International Programs of the American Phytopathological Society (OIP-APS), and I am the Chair the Regional Multi-state Project “Ecological and genetic diversity of soil-borne pathogens and indigenous microflora”. I have served as member of the Editorial Boards of Plant Disease (APS Press), Scientific Reports (Nature Publishing), and Ecuador es Calidad (Agrocalidad). Although I do not have an extension appointment, I have taken every opportunity available within the scope of my appointment, to deliver extension education talks and publications to growers (in English and in Spanish) mainly focused on ornamental crops and, currently, grapes.
Kitty Cardwell
Professor and Director

In 2016, Dr. Kitty Cardwell began exploring the possibility of expanding the subject matter of the NIMFFAB into animal systems. Since the inception of the group (including five faculty members associated with our department) their initial subjects were only plants and the microbes they can harbor. Now, with sophisticated diagnostics techniques, like E-probes, they have begun to explore animal systems. One of the biggest hurdles to overcome was quickly identifying multiple pathogen types, including genotypic species and strains, in a single sample, with a single procedure. They now have a new online user-friendly bioinformatics platform, MicrobeFinder® (MiFi®) that offers specially curated target-specific in silico nucleic acid probes for sensitive detection of unique pathogen signatures in metagenomic data. E-probes have proven useful in simultaneously detecting multiple causal agents of complex disease etiology such as bovine respiratory disease pathogens Mannheimia haemolytica, Pasteurella multocida, Histophilus somni, Mycoplasma bovis and Bovine Herpesvirus-1 in lung tissue. E-probes have also detected multiple infections by bacteria, viroids and RNA-viruses in citrus tree petioles as confirmed by PCR. With miniaturized sequencing technology, testing tissue in the field in near real time is now feasible. For any matrix in which the pathogen is prevalent, detection and a statistically positive diagnostic call can occur within the first 20 minutes of sequencing. The team has demonstrated a simple workflow for DNA extraction, sequencing of the mosquito metagenome and probing for Plasmodium species. MiFi® is ready to deploy for malaria reservoir monitoring, epidemiology, population dynamics research and drug resistance tracking.

Extraction of DNA from mosquitoes is simple and takes about 10 minutes. In five minutes or less, using MiFi® software they can detect the microbiota in raw metagenomic data, with no amplification needed. The team further suggests that E-probes can be developed and validated for all Plasmodium spp. in under two weeks. In addition, the price and portability or sequencers have become attractive and MiFi® works on any web-connected laptop computer.
I joined the Department of Entomology and Plant Pathology in July 2013 as the Medical and Veterinary Entomologist. Prior to my appointment, several experiences had enhanced my research and teaching. Growing up in Kenya and having malaria a couple times in childhood created the interest to pursue a PhD at the Johns Hopkins School of Public Health where my research focused on factors influencing Plasmodium development in Anophelines. My interest continued with a post doc at the University of Maryland at Baltimore focused on flea-borne Murine Typhus. Over the next 15 years, I studied aspects of vector-borne disease in the wider context of public health, living in Mozambique, central Illinois then Namibia with my family. Currently, I have a split appointment with a majority (70%) in research and 30% in teaching.

I really enjoy the courses that I teach. Introducing non-majors to the marvelous intricacies of vector-borne diseases systems around the world, not just in the United States, through Insects in Global Public Health is fun. In this course, we do not just learn the specifics but I try to expand understandings of how vector-borne disease systems impact the communities in which they happen so students, no matter the major, can see the connections of disease with poverty and the fragility of our own public health system. My majors course, Medical and Veterinary Entomology, is focused on these same vector-borne diseases where we explore many of the factors that have to come together for these diseases to occur.

My research has always focused on the wildly numerous factors that impact vector-borne disease systems. Diseases transmitted by arthropods never happen without many factors coming together for successful transmission to occur – a nidus of infection. In Oklahoma, this primarily means working in mosquito and tick systems but I’ve also had the opportunity to work with fleas. The majority of the work has been accomplished by excellent students – 7 Masters and 1 PhD – as well as many undergraduate Capstone and research assistants. Focusing on how landscape characteristics impact vector-borne disease systems, we’ve traveled throughout most of Oklahoma, sampling ticks and mosquitoes in diverse habitats, including urban areas and desolate rural areas, meeting many interesting people along the way. We have sampled ticks on black bear, cattle, goats and different species of birds and spent countless hours running Polymerase Chain Reactions in the lab to test for the genetic presence of known pathogens which are prevalent in Oklahoma.

These diverse research projects enjoy healthy collaborations in the department. Many are directly linked with Dr. Justin Talley’s livestock extension program. As producers in the state ask questions about various vectors, we work to connect the dots between what is happening at the local level as well as establish what is happening on the Great Plains. Bringing Dr. Francisco Ochoa-Corona into the team, we are now developing a rapid test for three species of Anaplasma that can be used to directly test the blood of cattle and sheep in field settings. Through these diverse collaborations, we are bringing the concerns of Oklahomans to the forefront, even as we seek answers to questions of national and international importance.
I grew up on my parents' farm near Olin, Iowa, where they mainly raised hogs, beef cattle, corn, oats, and alfalfa. All 13 years of primary and secondary school were completed at Olin Consolidated School where I graduated in May 1979. I attended Wartburg College, Waverly, Iowa, and graduated with a double major in Mathematics and Biology in 1983. During the summer of 1982, I had an internship in the Department of Entomology at OSU where I served as a Research Technician.

In August 1983, I permanently moved to Stillwater to work as an Agriculturist in the Department of Entomology at OSU with Dr. W. Scott Fargo and conducted research on squash bugs for the next seven years. While working full-time, I earned my M.S. degree in Entomology in December 1988. Research projects included modeling squash leaf area; population dynamics; developmental rates of squash bugs at constant temperatures; host effects on survival, development, reproduction, and longevity of squash bugs; ovipositional behavior; within-plant distribution of insects; spatial dispersion patterns and sequential sampling plans; colonization with varied planting dates; probing behaviors on cucurbit hosts; and insecticide applications for squash bug management.

Our research focus changed in 1990 to stored grain insects. I worked as an Agriculturist, then Senior Research Specialist, and finally the Manager of the stored grain insect laboratory researching insect pests of stored grain products. During this time, I worked with Dr. Fargo until his untimely death at age 44. Subsequently I worked with Dr. Tom Phillips, and Dr. George Opit. From 2001 to 2010, I was also the Manager of the Stored Products Research and Education Center (SPREC) west of campus. Research projects included influence of probe trap type and attractants on capture of stored grain beetles; immigration of insects into farm stored wheat; IPM perceptions and practices in grocery stores; cylinderized phosphine for insect control; sealing storage facilities for effective fumigations; combining chlorpyrifos-methyl with other products for insect control; utilizing electronic grain insect probe traps; modeling insect flight activity; spatial analysis of pheromone-baited trap captures; evaluating spinosad products for long-term protection; ozone fumigation; closed loop fumigation; investigating ethylene gas as an insect control measure; evaluating sulfuryl fluoride for fumigating food processing facilities; seasonal abundance and distribution of psocids in an animal feed warehouse; and heat treatments for disinfestation of concrete grain silos.

During the research phase of my career, I supervised, trained, and coordinated 34 undergraduate hourly employees and 34 hourly technicians, and assisted 24 graduate students, 7 postdoctoral fellows, and 5 visiting scientists.

I became the Director of the Oklahoma Agricultural Leadership Program in April 2010 for 75% of my appointment and have held the Oklahoma Agricultural Leadership Professorship since 2011. Shortly after taking on this new role, I changed from a research position to an extension position for 25% of my appointment in the Department of Entomology and Plant Pathology. Even before my formal extension appointment, I was active in grain elevator and fumigation training workshops across the state and also in
surrounding states working closely with Dr. Gerrit Cuperus and Dr. Jim Criswell and now with Dr. Carol Jones in the Department of Biosystems and Agricultural Engineering. I also assist Kevin Shelton and Charles Luper with training during fumigation practicals for those becoming certified in the fumigation category.

I have been a member of the Entomological Society of America since 1986 and regularly participate in the Southwestern Branch of the ESA meetings and national meetings, and have attended three International Conferences of Entomology. I was a continual attendee and presenter at the Rocky Mountain Conference of Entomologists from 1985 until its termination in 2012, serving as an officer from 1992 to 2012. I have served as the only Editor of Sensilla, the monthly departmental newsletter, which began in January 1989.

In my spare time, I enjoy genealogy research, gardening, and photography, and regularly participate and serve in my church, First United Methodist Church, in Stillwater.
Graduate Students

Claudia Diaz  
FAPC Research Symposium 2nd Place

Andrea Salazar  
Entomological Society of America 1st Place Graduate Student Poster Presentation

Elizabeth Knowlton  
Southwestern Branch Entomological Society of America  
M. S. Oral Presentation 3rd Place

Kylie Sherill  
Southwestern Branch Entomological Society of America  
M. S. Oral Presentation 2nd Place

Jessica Lindenmayer  
Southwestern Branch Entomological Society of America  
Ph.D. Oral Presentation 3rd Place

Salome Suarez  
Graduate Research Excellence Award  
Williams Distinguished Graduate Fellowship Award

Melissa Reed  
NACTA Educator Graduate Teaching Award  
Williams Distinguished Graduate Fellowship Award

Undergraduate Students

Jaicey Colvin  
General Honors Award 2018-2019

Rayne Key  
Southwestern Branch Entomological Society of America  
Undergraduate Poster  
2nd Place
Brandon Henriquez
Entomological Society of America 2nd Place Undergrad Student Poster Presentation

Leon Tan
Southwestern Branch Entomological Society of America Insect Photography Artistic Photo

Maddy Moore
Southwestern Branch Entomological Society of America Undergraduate Oral Presentation 3rd Place

Mason Taylor
Entomological Society of America 1st Place Undergrad Student Poster Presentation

Victoria Pickens
Southwestern Branch Entomological Society of America Undergraduate Student Achievement in Entomology Southwestern Branch Entomological Society of America Oral Presentation 2nd Place CASNR Senior of Distinction and Dean’s Award of Excellence World Association for the Advancement of Veterinary Parasitology Student Travel Award Entomological Society of America 2nd Place Oral Presentation

Liam Whiteman
Southwestern Branch Entomological Society of America Percival Scientific Undergraduate Entomology Student Activity Award

Faculty

W. Wyatt Hoback
NACTA Educator Award

Bob Hunger
OK Wheat Commission Extending the Legacy Career Achievement Award

Phillip G. Mulder
Fellow of The Entomological Society of America
Fernanda Proaño Cuenca
Featured Graduate Student

Hometown
Quito, Ecuador

Future Career plans?
I plan to continue doing research encompassing many areas of plant pathology. I would love to travel the world, share what I have learned, and my ultimate goal is to do science and impact Ecuadorian agriculture.

What led you to study Plant Pathology?
I took some plant science classes during college in Ecuador but was after my first international internship experience that I discover plant pathology. In summer 2012, I did an internship in our department. I exposed myself for the first time to many new and rewarding experiences that helped me to develop relevant skills in methods for the diagnosis and genetic analysis of plant pathogens. The experience impacted my view of the world, my career goals, and myself as a human being. After it, I realized that my impact on agriculture and plant pathology would be as a scientist.

Who inspired your interest in Plant Pathology?
My interest in science, in general, started in college, working as an undergraduate research assistant in a Microbiology lab under the wise guidance of M.Sc. Alma Koch. She introduced to me the world of research for the first time. Later, Dr. Carla Garzon guided me and showed me the wonderful world of Plant Pathology. She certainly is a great role model and has always impulse me to go beyond my limits. Lastly, I consider that many professors and collaborators during my graduate studies have been a source of inspiration too.
As part of your graduate studies, what is your favorite activity or responsibility?
I enjoy research and the learning process behind it, but I would say that teaching has been one of the most delightful activities as a graduate student. It has helped me to improve my communication skills, and it amazes me how, through it, you can inspire others. Also, it has been rewarding for me to mentor undergraduate and graduate students; it has been a way to give back all that has been given to me.

What sage advice do you have for someone interested in your major?
My advice to anyone would be to compromise with what you choose to do. It is essential to open our minds and ears to what is beyond ourselves. Read and strive to do your best always, even when things do not go right. Do not be afraid to be a leader and expose yourself to new challenges and adventures.

Outside of the major, what is your favorite activity/way to spend time?
I love nature, so I enjoy hiking. I like to travel and to explore places and food. Also, I love to exercise; it is a great way to raise my energy levels and to learn discipline plus the many other incredible benefits.
Melissa Reed
Featured Graduate Student

Hometown-
Skiatook, Oklahoma

Future Career plans?
I would like to either teach at the college level or work as an aquatic invertebrate taxonomist

What led you to study entomology?
While I have had an interest in Entomology since I was an undergrad, I don’t think I would have pursued a degree in Entomology without the guidance and encouragement of my advisor Dr. Wyatt Hoback.

Who inspired your interest in entomology?
One of my favorite undergraduate teachers and my mentor at Roger State University Dr. Don Glass inspired my interest in Entomology. Dr. Glass taught my zoology, field zoology, and aquatic biology classes at Roger State. Dr. Glass took our class on numerous field trips to collect aquatic and terrestrial insects, taught us multiple insect collecting techniques, and required us to turn in a pinned insect collection. But the most important part was that Dr. Glass made the entire experience really fun and enjoyable!

As part of your graduate studies, what is your favorite activity or responsibility?
My favorite activity as a graduate student is to support and mentor students. I really enjoy helping students acquire knowledge and gain experience.

What sage advice do you have for someone interested in your major?
The advice I would give to someone interested in Entomology is to be prepared to work hard. While Entomology can be a fun and interesting major, it is a science major and requires a lot of dedication and hard work.

Outside of the major, what is your favorite activity/way to spend time?
Outside of my research, teaching responsibilities, and course work I enjoy traveling, hiking, fishing, and gardening.
Where Are They Now?

Interview with Dr. John Krolak

Mulder – How many degrees do you hold from OSU and when was your last graduation date?

Krolak – Only one degree from OSU, a Ph.D. and I graduated in 1981.

Mulder – What was your major emphasis and who your advisor?

Krolak – My major emphasis was based on Dr. John Sauer’s NIH grant proposal on fluid transport across the salivary gland tissue. Dr. John Sauer was my advisor.

Mulder – Do you feel our department prepared you well for your first job?

Krolak – Yes. Dr. Sauer allowed me to be totally independent in arriving at my research approach. In subsequent years he allowed me to think on my own and proceed on with research. Gave me confidence to do the work, accomplish it and write it up.

Mulder – How long did your first graduate job last?

Krolak – My position as an NIH Postdoctoral Research Fellow at The University of Texas Medical School at Houston from 1981 to 1985. I conducted biochemical research in the area of cellular secondary messenger systems such as cyclic AMP and Calmodulin. I also conducted research in the area of Duchenne Muscular Dystrophy.

Mulder – Why did you choose this area you chose for your career?

Krolak – I wanted to get into industry after my postdoctoral position but at that time there was no bridge that existed from postdoc to private sector. Since my Dad’s involvement was with the military, I knew they did research. I went to the Army and they told me I would go in as a Captain but wouldn’t be promoted for seven to ten years due to the backlog. I then went to the Navy and they wanted to send me to Cairo, Egypt, which I could not do as I just got married and my wife had never left Texas. I then moved onto the Air Force where they said that they had a biochemist position at the Armed Forces Radiobiology Research Institute located in Bethesda, Maryland. I jumped at this opportunity. I received further research training in biochemistry along with additional training in the area of radiobiology research. After three Air Force assignments, I joined the National Institute for Occupational Safety and Health (NIOSH)/Centers for Disease Control (CDC) and Prevention in Atlanta, Georgia in 1992. I chose health related areas rather than entomological because of opportunities to learn more about other science fields.

Mulder – How much mentoring did you feel you needed after completing our program and moving into your first 2 positions?

Krolak – With Dr. Sauer it was hands off mentoring, but he was open for discussions all the time and was a wonderful mentor. I could consult with him and he would give excellent advice and ideas. As a post doc, mentors showed me how to make antibodies and other laboratory procedures that may not have been familiar to me.

Mulder – What is the emphasis of all your current position?

Krolak – At the end of this year, I will retire from the CDC, but have developed several Education, consulting, nurturing, and supportive positions with many institutions including:

- Adjunct appointments – Kennesaw State University, Marietta, GA – Taught two courses in Environmental Science.
- Oglethorpe University – Taught courses in Environmental Science, Ecology, and Bioterrorism agents and their biological effects.
- Georgia Gwinnett College – Taught a few sections of Human Anatomy & Physiology
- Belhaven Christian College – taught U.S. HealthCare Management Systems
- Georgia State University – currently teaching Human Anatomy & Physiology (Lecture & Lab)

Mulder – Was the salary associated with your positions after graduate school in-line with your expectations?

Krolak – I received much more than I ever expected. Going from a $5,000 OSU stipend to $15,000/year as a Post Doc was quite a bump and then working at the CDC where the salary has been excellent.

Mulder – Looking back, would you have taken a different direction or taken additional classes or pursued other studies to prepare for the job market?
Krolak - No. I have always been and will continue to be a life-long learner, so if I ran into a subject I did not know very well, I found the appropriate textbooks and sources and read about it sufficiently to then be able to teach it to students.

Mulder - Has your career choice blended well with your family and personal time?

Krolak - Yes. My wife Brenda is very understanding as I work fulltime at the CDC and teach as an adjunct at several institutions. We both continue to work, so with my active work schedule and much of her time spent as caregiver to our youngest grandchild, it is sometimes a challenge to find time for one another, but we still find opportunities and this weekend (homecoming at OSU) is one of those special times.

Mulder – Looking back, what other roles would you have explored on campus?

Krolak - None, I was busy enough with my research and didn’t think outside of work. I did occasionally go ‘kicker’ dancing (aka ‘two step’) on the weekends.

Mulder – The final question, I am quite sure I know the answer to this one, do you still cheer for the Cowboys?

Krolak - YES! At home, it is not uncommon for me to stand in front of the TV for the entire game, yelling and screaming for the Cowboys to win!

Mulder - John, in light of that response, I would suggest that you would fit quite well into the student section, since they pretty much stand during the entire game. Thank you and your wife for sharing some memories and time with us and I hope you have a wonderful homecoming weekend.
How many degrees do you hold from OSU and when was your last graduation date?
I hold a M.Sc. in Entomology and Plant Pathology and a Ph.D. in Plant Pathology from OSU. My last graduation date was December 13th 2014

What was your major emphasis and who was your advisor?
I worked on hormesis under the advice of Dr. Carla Garzón and later on my Ph.D. I worked on turfgrass pathology under the advice of Dr. Nathan Walker

Do you feel that our department prepared you well for your current job?
Yes, all the experience I gained on how to conduct scientific research and as a lab and teaching assistant has allowed me to work at a University as an Associate Professor

What was your first post-graduate job, your current position, and how long have you been in your present position?
My first position was as an Analytic Chemistry teacher at Universidad de las Americas in Quito-Ecuador. Soon I joined Universidad de las Fuerzas Armadas-ESPE, where I currently work as an Associate Professor. I have been in my current position since January 2015.

Why did you choose this area for your career interest?
The economy of my home country, Ecuador, is based on agriculture. Plant health problems are often overlooked and solved with an excessive use of agrochemicals. Also, there are several emerging plant diseases that are not well described and are causing significant losses. I believe that research on the etiology, diagnosis and treatment of such diseases is fundamental for the development of the country.

How much mentoring did you feel you needed after completing our program and moving into your present position?
After finishing the program at OSU I felt confident to make my own decisions in the professional field. Nevertheless, I always felt I had the support of my advisors in case I needed them.

What is the emphasis of your current position?
Currently I am teaching six different classes, Bioinformatics, Plant breeding and Experimental design for undergraduates, and Plant Pathology, Bioinformatics and Biosafety for graduates. I am also doing research related to plant pathology, biodiversity, and synthetic biology. I also run a private lab where I do plant disease diagnosis, microbiome analyses, and plant health related product development.

Was the salary associated with your positions after graduate school in line with your expectation?
Yes.

Looking back, would you have taken a different direction or taken additional classes or pursued other studies to prepare yourself for the job market?
I would have taken more classes on bioinformatics but I’ve had the chance to learn by myself after graduating.

Has your career choice blended well with your personal time and/or family time?
Yes, most of the time.

Where do you see yourself in the next 5, 10, 15, or 20 years? What role(s) would you like to explore?
I see myself leading a research group at the University and launching our first products from our private lab to the market.
How well do you keep up with the department and things at OSU?
I try to keep up as best as I can. In 2018 I joined the OSU Entomology and Plant Pathology department as an adjunct professor. I am part of the committees of two graduate students and maintain collaborations with former advisors. My students often do internships at OSU so we are in constant communication.

Did your experience with U.S. football influence how you see football in your country?
Definitely, I enjoy watching football, especially when the cowboys are playing. Unfortunately, it is hard to watch the games from Ecuador but Facebook posts from friends keep me updated.
Where Are They Now?

Interview with Mr. Sterett Robertson

Mulder - How many degrees do you hold at OSU and when was your last graduation date?

Sterett - Two degrees: B.S. in Entomology (1972) and MS Medical and Vet Entomology (1974)

Mulder - What was your major emphasis and who was your advisor?

Sterett - My advisor was Dr. Jakie Hair with an emphasis on: Lone Star tick research - field biology and ecology studies in Cookson Hills State Game Refuge (Cherokee County, OK). Marked released ticks in an arena and recovered 70-80% success rate.

Mulder - Do you feel the department prepared you well for your first job?

Sterett - I told my parents that someday I would like to work for Dow Chemical. Dr. Hair had a good friend at Dow Chemical, and after I graduated I got an interview and was offered my dream job which lasted 35 years. I was hired as Field Development Specialist working out of New Jersey (covering West Virginia north to Maine) for a few years then moved to Dallas, TX for 10 years. Michigan was home next, then Dow AgroSciences in Indianapolis, IN where I currently reside. At one point I left there temporarily for 2 years to start my own pest control company in Dallas, Texas. Loved the pest control industry; however, I quickly discovered that customers drove me crazy and signed back on with Dow Chemical.

Mulder - How long did your first job after graduation last?

Sterett - I was hired at Dow Chemical in 1974. Left Dow in 1985 to start my own pest control company in Dallas, TX. Ultimately, rehired at Dow Chemical in 1987, and retired in 2007.

Mulder - Looking back, why did you choose this area for your career?

Sterett - Initially I was a pre-vet student, did not like studying and was told in a calm way that I would not be a veterinarian. During freshman orientation, Ray Eikenberry, OSU Entomology Professor, spoke of other options and areas of interest to look into and in Sterett's sophomore year got into entomology with Dr. Hair working with ticks.

Mulder - How much mentoring did you feel you needed after completing our program and moving into your first professional positions?

Sterett - Probably needed more mentoring than I took advantage of, but when I left OSU I felt learning was fun and wanted to try new things. I am definitely a life-long learner.

Mulder - What is the emphasis of your current position?

Sterett - Grandchildren and being an entomology 4H project leader in Boone County, Indiana. It's a small group of children who have a passion, not just for entomology, but for science. I have been mentoring children from the 3rd grade on up. Also serve as grandfather to six grandchildren around the U.S.

Mulder - Was the salary associated with your positions after graduate school in-line with your expectations?

Sterett - It was better than my expectations. At the time I graduated with my M.S. my friends graduated with their Ph.D. moving on to entry level university positions. I was making as much as them. When I retired I was making more than the average tenured faculty.

Mulder - Looking back, would you have taken a different direction or taken additional classes or pursued other studies to prepare for the job market?

Sterett - Always very happy with the path I chose as it fit me. Looking back, I wish I would have paid more attention in class, particularly statistics and organic chemistry. It would have benefited me in the future.

Mulder - Has your career choice meshed well with your family and personal time?

Sterett - I never had a desire to go down the academic route. Industry was where I wanted to be.

Side note - Casey, one of Sterett's children was present at this interview and mentioned sometimes his Dad traveled
for long times when working for Dow, but always had time to throw a ball and attend school functions. Casey saw that his Dad loved his job, but also had time for family.

**Mulder - What other roles would you liked to have explored on campus?**

**Sterett** - Don’t know about other roles, but always had an interest in the natural world. I currently enjoy birding, and like to identify plants, flowers, and trees. I like to know what’s around me. I would have enjoyed taking Ornithology while at OSU. I still enjoy motorcycling, scuba diving, and those grandchildren.

**Mulder - Do you still cheer for the Cowboys?**

**Sterett** - I am an avid fan. As a member of the OSU Alumni Association of Indianapolis we have a watch party when the Cowboys play. I am a lifetime member of the Alumni Association and the Heritage Society. As a student at OSU, I always attended football, basketball, and wrestling events and currently watch on TV when available. One thing I would really love to see in person, is OSU beat OU. I know it has happened but during my six years on campus it did not.
The department was fortunate for the third year in a row with getting either a DASNR Champion or a Distinguished Alumnus selected by the DASNR Honors selection committee. Our honoree for 2019 was Distinguished Alumnus, Dr. Tererai Trent. Rooted in humble beginnings, Tererai grew up in a cattle-herding family in rural Zimbabwe, in a country known as Rhodesia under colonial rule, where cultural practices and a war that liberated her country charted the course of her life. Despite facing many obstacles, she never lost sight of her dreams for an education. Dr. Trent could not have imagined that her steadfast determination, hard work and belief in her dreams would eventually not only earn her multiple degrees, but also a prominent global platform with world leaders and international businesses where she advocates for universal access to quality education.

Dr. Tererai Trent is one of the world’s most acclaimed voices for women’s empowerment and quality education. She is the founder of Tererai Trent International, an educator, motivational speaker, and Oprah’s “favorite guest of all time.” Tererai received her bachelor’s and master’s degrees from Oklahoma State University in Agricultural Education and Plant Pathology, respectively. She went on to ultimately obtain her doctorate in interdisciplinary evaluation from Western Michigan University. Tererai also holds a Masters of Public Health degree in Epidemiology from the University of California, Berkeley. From 2002 to 2010 she served as Deputy Director for monitoring and evaluation with Heifer International. She holds three honorary Doctor of Science distinctions from Loyola University, University of Massachusetts, and Oklahoma State University, where she served as keynote speaker for our undergraduate commencement in 2014.

Tererai currently teaches courses in Global Health at Drexel University. She has published two highly acclaimed children’s books and is the author of the award winning, The Awakened Woman – Remembering & Reigniting Our Sacred Dreams (Atria/Enliven Books). Tererai was recently named Global Ambassador of Education and Peace by the UN General Secretary and High Commissioner. She also serves as the president of The Awakened Woman LLC, a company dedicated to empowering women with tools to thrive as they achieve their dreams.

With the establishment of Tererai Trent International and a generous gift of $1.5 million U.S. she was instrumental in building or rebuilding 11 schools in her native Zimbabwe. She partners with the Oprah Winfrey Foundation and Save the Children. Tererai has been honored with a life size statue in Times Square in New York City, and continues to lead the global charge in the fight for quality education for all children and for women’s rights. She has become a symbol of hope and living proof that anything is possible. Her favorite motto is “Tionogona” meaning, “It is achievable.”
Dr. Garzon and Tererai

Tererai and Dr. Hunger

Tererai, her sister Beatrice and Dr. Opit

Tererai and Dr. Mulder
In Memoriam of Dr. Anita Lynn Smith

Dr. Anita Lynn Smith, 55, of Yuma, Arizona, went home to be with her Lord on July 3 at a hospice in Phoenix, AZ, after a prolonged battle with cancer. She was born on August 17, 1963 in Tulsa, OK to the late Garland Mike and Ila Mae Miller née Britton.

She married Matthew Paige Smith on October 8, 1993 in San Antonio, TX; they celebrated their 25th anniversary last October. She earned her B.S., M.S. and Ph.D. in Entomology from Oklahoma State University. At the time of her death she was a faculty member at Arizona Western College, where she taught entomology and biology. During her time at AWC she served as an inspiration to many of the young women who sat in her classroom.

She is survived by her husband, their son Zachary Paige Smith and his wife Brittani, and their three daughters: Raelynn Marie, Tempest Jane, and Islay Paige.

A celebration of life will be held in Yuma, AZ on August 17. A scholarship at AWC is being established in her name to assist women who wish to pursue a four-year degree in the sciences.

Publications


Espíndola AS, Schneider W, Cardwell, KF, Hoyt PR, Marek SM, Melouk H, Garzon CD. 2018. Inferring the presence of aflatoxin-producing Aspergillus flavus strains using RNA sequencing and electronic probes as a transcriptomic screening tool. PLOS ONE. https://doi.org/10.1371/journal.pone.0198575


Support the Department

Thank you for supporting the Department of Entomology and Plant Pathology. In the last issue of this newsletter, we basically took the shotgun approach to asking for support. Well, this time we want to focus on some of our most valuable and worthy funds that help us do a better job for our students, faculty, and staff. We also want to provide our readers with an appreciation for what led to these foundation accounts and provide you an idea of how they are used. If you are so inclined, please help in supporting these very worthy causes. You may indicate how much you would like to donate on the line to the right of the fund description and submit to the address below. If you wish to give to more than one fund, you may do so with one check or credit card transaction.

D.E. Howell Scholarship Fund  (Fund # 21-34600)  $________________

This endowed scholarship fund was established by the Oklahoma Pest Control Association and the Friends of “Mike” Howell. Dr. Howell was the Department Head of Entomology from 1952 to 1970. During his tenure as department head, many advanced degrees were awarded to military and civilian students, specifically in medical and veterinary entomology. The scholarship supports full-time students in the Department of Entomology who display high academic achievement (GPA 3.0 or higher) and outstanding leadership. Preference is given to incoming freshman but an upperclassman can be considered.

Plant Pathology  (Fund #21-30300)  $________________

Income received annually from this fund shall be used for program support of plant pathology. This is not an endowed fund and may be supported in nearly any fashion with gifts from donors. It provides programmatic support for plant pathology functions within the department or at regional and national meetings. This fund was established to support visiting scientist presentations on campus, travel, or other expenses associated with meetings, so that OSU plant pathology remains current and competitive within the discipline.

Entomology Program Development  (Fund #21-27900)  $________________

Income received annually from this fund shall be used for program support of entomology. This is not an endowed fund and may be supported in nearly any fashion with gifts from donors. It provides programmatic support for entomology functions within the department or at regional and national meetings. This fund was established to support visiting scientist presentations on campus, travel, or other expenses associated with meetings, so that OSU entomology remains current and competitive within the discipline.

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