

S P R I N G 2 0 1 4

SS-ASPB

Newsletter of the Southern Section of the American Society of Plant Biologists

Hello from Dr. Jay Shockey, 2013-2014 Chair of the SS-ASPB

Symposium

From March 29-31, 2014, we had an outstanding annual meeting in Lexington, KY, organized by Dr. Rick Turley, the 2013-2014 Secretary/Treasurer and Drs. Joe Chappell and Robert Houtz from the University of Kentucky, who served as our local hosts. Dr. Ashlee McCaskill organized the 2014 Kriton Hatzios Symposium on Plant Symbiotic Associations. Thank you, Rick, Ashlee, Joe and Bob for all your hard work! The conference turned out great! We had over 110 participants, including 23 talks, and 47 posters, plus many others who asked questions and joined in the discussions. Thank you to everyone who contributed to the informative discourse.



Dr. Rick Turley



Dr. Ashlee McCaskill



Dr. Joe Chappell

The 2014 Kriton-Hatzios Symposium focused on plant symbiotic interactions.

The featured speakers were:

Dr. Carl Fellbaum

Dept. of Botany and Microbiology, South Dakota State University

"Regulation of Nutrient Uptake, Transport and Exchange Processes in Arbuscular Mycorrhizal Interactions."

Dr. Julia Frugoli

Dept. of Genetics and Biochemistry, Clemson University

"Up, Down, and Back Again: Long Distant Signal Transduction in the Autoregulation of Nodulation"

Dr. Stanley Faeth

Dept. of Biology, University of North Carolina-Greensboro

"The Ecological Consequences of Hybridization in Asexual Grass Endophytes"

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About the meeting...



We met at the Hyatt Lexington, adjoining the legendary college basketball arena/shrine Rupp Arena. March Madness was in full swing; the teams for UK and the Univ. of Louisville met in the Sweet 16 round on Friday evening. The mixer was held on Saturday night, and our own brand of excitement began to mount as students, post-docs, college faculty, and government scientists began to arrive. We began to meet and greet each other over snacks and drinks at the annual mixer, after which many attendees rode the trolley car to nearby eating and drinking establishments.

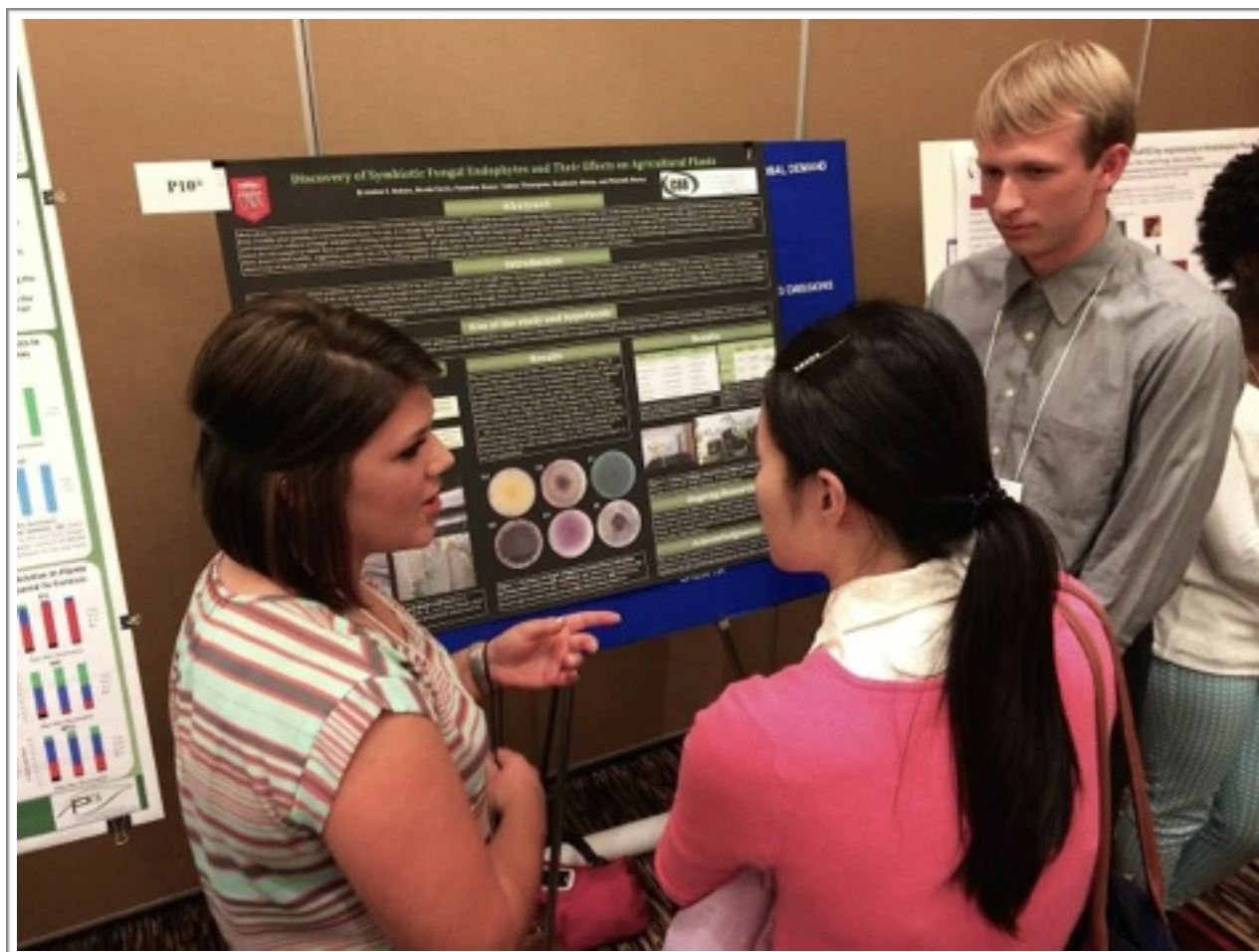
Sunday morning, March 30th, after a continental breakfast outside the Regency Ballroom, I welcomed all attendees and provided some information about our meeting. The scientific program commenced with a general session of 7 excellent talks by faculty and post-docs, followed by a refreshment break. The full complement of 47 posters was up by lunch time and viewing began in advance of the poster session planned for later in the afternoon.



Two of the General Session speakers from Sunday March 30: Drs. Mautusi Mitra (University of Western Georgia) (left); and Nathan Hancock (University of South Carolina-Aiken) (right).

After the break, we listened to a group of enthusiastic and extremely bright graduate students, who presented 16 talks in the annual grad student oral competition, which was moderated by Dr. Becca Dickstein. All of the talks were outstanding, and trying to select the best three was very difficult. Along with fellow judges Paul Stephenson and Ashlee McCaskill, we heard about current research in a variety of topics within plant biology, ranging from ecology to biochemistry and molecular genetics.

Later that afternoon came the poster session. We had exceptional participation levels in the poster room this year, with a total of 47 posters, 13 of which were entered into the Aubrey Naylor Undergraduate Poster Competition. Like the graduate student talks, the range of topics covered was very broad, very interesting, and very informative to all. The team of poster judges (including Drs. Joe Chappell, Mautusi Mitra, and Ken Korth) quizzed the poster presenters to explain their experimental strategies, results, conclusions and planned future experiments. The posters were all well done.



A scene from the 2014 SS-ASPB poster session: undergraduate students Nicole Davis and Brandon Nelson (University of Western Alabama) discuss their research project with a fellow attendee.

I think I speak for most of the “senior” attendees at the meeting when I say that I couldn’t be more impressed with the quality of the work, and the professionalism demonstrated by the student presenters. You, and your respective scientific mentors and advisors should be very proud. Good luck over the coming year! Clearly, the future of plant biology is in good hands.

The annual banquet was held Sunday night, in the Kentucky Room, within the Hyatt Complex. The food was excellent, and the company was great! The banquet always serves as an opportunity to mingle and network on a more informal basis, and is the time for presentation of the awards to the winners of the student competitions.



James Schaffer, winner of first prize in the 2014 graduate student oral competition.



Richard Sante, from East Tennessee State University, 2nd place winner, 2014 graduate student oral competition.



Ipeleng Randome, from the University of Arkansas, won 3rd prize in the 2014 graduate student oral competition.

Graduate Student Oral Competition Winners

The winners of the graduate and undergraduate student competitions were announced at the banquet. This year, the judges had a particularly difficult time choosing the winners of the competitions. There were many outstanding presentations and the rest were merely excellent. Congratulations to all the students who presented the results of their research.

James Schaffer, a student in **Dr. Scott Gleeson's** laboratory at the University of Kentucky, won First Prize in the graduate student oral presentation for his talk "*Mammalian herbivory on fourteen experimentally planted native hardwood tree seedlings of the Kentucky Bluegrass savanna-woodland community.*"

Richard Sante, a student in **Aruna Kilaru's** lab at the University of East Tennessee State University, won 2nd prize for his presentation titled "*Occurrence and Implications of Anandamide (a mammalian neurotransmitter) in the moss Physcomitrella patens.*"

Ipeleng Randome, a student in **Andy Pereira's** lab at the University of Arkansas, won 3rd prize for her talk "*Towards development of an Ac-Ds activation tagging system in tomato.*"

Aubrey Naylor Undergraduate Student Poster Competition Winners

The winners of the Aubrey Naylor Undergraduate Student Poster competition were also announced at the banquet. Choosing the three best posters gets harder every year. All of the others were very informative, and we thank all the students for sharing your research with the group.

Kevin Mutore, a student in **Kent Chapman's** lab, University of North Texas, won the competition this year for his poster "Characterization of two genes in Arabidopsis that control lipid droplet formation."

Taylor Marshall (**Ashlee McCaskill's** lab, University of North Georgia) won 2nd prize in the competition for his poster "Spadix formation in *Phinellia pedatisecta*."

Ashley Strother, from **Nathan Hancock's** lab at the University of South Carolina-Aiken, took home 3rd prize in the poster competition for her presentation of "Targeted insertion of the transposable element, mPing, by manipulation of transposase proteins."



Kevin Mutore, winner of the 2014 Aubrey Naylor undergraduate student poster competition.



Taylor Marshall, University of North Georgia, 2nd place finisher in the 2014 Aubrey Naylor undergraduate poster competition.



Ashley Strother, University of South Carolina-Aiken, 3rd place finisher in the 2014 Aubrey Naylor undergraduate student poster competition.

The 2012 Kriton-Hatzios Symposium on Chloroplast Biology.

The morning of March 31 was the date of the Kriton Hatzios Symposium. This symposium annually draws some of the leading figures in research regarding a specific, timely topic in plant biology. The symposium is held each year in memory of Dr. Kriton Hatzios (pictured to the right), who was Head of the Virginia Agricultural Experiment Station, and Associate Dean for Research at Virginia Tech College of Agriculture and Life Sciences, and who died in 2003.



Dr. Kriton Hatzios;

The featured speakers this year and their presentations were:

Dr. Carl Fellbaum Dept. of Botany and Microbiology, South Dakota State University
"Regulation of Nutrient Uptake, Transport and Exchange Processes in Arbuscular Mycorrhizal Interactions."

Dr. Julia Frugoli Dept. of Genetics and Biochemistry, Clemson University, *"Up, Down, and Back Again: Long Distance Signal Transduction in the Autoregulation of Nodulation"*

Dr. Stanley Faeth, Dept. of Biology, University of North Carolina-Greensboro, *"The Ecological Consequences of Hybridization in Asexual Grass Endophytes"*

This symposium was organized by Dr. Ashlee McCaskill. A summary of the presentations can be found on the next page.



Left to Right: 2014 Symposium speakers Dr. Julie Frugoli, Dr. Carl Fellbaum, Dr. Stan Faeth, and Vice Chair/Symposium Organizer Dr. Ashlee McCaskill.

Summary of the symposium...

by Dr. Ashlee McCaskill

Dr. Carl Fellbaum

“Regulation of Nutrient Uptake, Transport and Exchange Processes in Arbuscular Mycorrhizal Interactions”

Mycorrhizal fungi provide plants both nutrients (nitrogen, phosphorus and potassium) as well as stress resistance. In exchange plants transfer as much as 17% of their photosynthate to the fungal partner. This carbon from the host plant triggers the uptake of minerals by the fungus. Does carbon also stimulate nitrogen and phosphorous transport in common mycelia networks (CMN)? By growing *Medicago* in sun and shade, which affects their carbon allocation to the fungi, Carl was able to address this question. He found that in CMNs, fungi allocate resources to the hosts that are able to provide the most benefit. However, the fungi will maintain a high colonization status even in low quality hosts. The hosts in turn compete with carbon for fungal resources; however, the presence of low benefit hosts still increases fungal transport of phosphorus and nitrogen, even to low benefit hosts.

Dr. Julia Frugoli

“Up, Down and Back Again: Long Distance Signal Transduction in the Autoregulation of Nodulation”

The *sun* (*super numerary nodules*) and *rdn1* (*root determined nodulation 1*) mutants in *Medicago* do not have the ability to autoregulate nodule formation, which results in the formation of five to ten fold more nodules than wild type. Previous grafting experiments between wild type plants and *sun* mutants showed that the regulatory signal travels from the shoot to the root. SUNN is an LRR-receptor kinase localized to the plasma membrane of vascular cells and appears to be associated with plasmodesmata. The ligand that binds to the SUNN receptor may be a CLE signaling peptide encoded by MtCLE12/13. CLE act as extracellular signaling molecules. These signal peptides have been shown to move through the vasculature from root to shoot via the xylem. Similar to SUNN, RDN1 is expressed in the vasculature and mutations in this gene result in increased nodulation. Unlike *sun*, grafting experiments between *rdn1* mutants and wild type plants showed that hyper-nodulation from this mutation is root controlled. However, it has been shown that SUNN and RDN1 act in the same signaling pathway. The RDN1 protein is targeted to the secretory pathway and may function as a hydroxyproline O-arabinosyltransferase. These proteins catalyze post-translational modifications via the addition of L-arabinose to CLE signaling peptides.

Dr. Stanley Faeth

“The Ecological Consequences of Hybridization in Asexual Grass Endophytes”

Interspecific hybridization is common among plants and animals and may result in adaptive variation and increased diversity. However, little is known about hybridization among microbes or its ecological consequences. Many asexual, vertically-transmitted epichloid fungal endophytes are of hybrid origin. Hypotheses for the prevalence of hybrid endophytes include increasing genetic variation for 1) infected host plants to cope with stressful environments or 2) novel alkaloids that increase resistance to herbivores. We tested these hypotheses with a native host grass, *Festuca arizonica* (Arizona fescue) via laboratory, greenhouse and field manipulative experiments, observations, and bioassays. Plants infected with hybrid (H+) endophytes outperformed and outcompeted non-hybrid (NH) infected and uninfected (E-) plants in low resource environments in the greenhouse, but performed better in the field under high nutrient and high water conditions. In addition, H+ plants were more resistant to aphid herbivores, as predicted by their alkaloid geno- and chemo-types. However, predators of aphids on H+ plants had reduced fitness and avoided H+ plants. Thus, the benefits of infection by hybrid endophytes may be counterweighed by negative effects on the third trophic level, and partially explain why H+ plants are less frequent than NH+ or E- plants in natural Arizona fescue populations.

One of the great things about the large geographical range of the Southern Section is the many different views and landscapes the meeting sites offer as the years go by. From Kentucky bluegrass this year to views of the Gulf of Mexico next year, there's always something to keep us coming back!



Next year's meeting is in Mobile, Alabama from March 28-30, 2015. We hope to see you there!

Remember...

There's still time to register for this year's national ASPB meeting in Portland, Oregon! (<http://my.aspb.org/page/Oregon2014>).

Plant
Biology
2014
JULY 12-16 PORTLAND, OREGON

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2014-2015 Officers

Chair

Dr. Ashlee McCaskill
Assistant Professor of Plant Biology
University of North Georgia
436 HNS Building
Dahlonega, GA 30597
(706) 864-1954
amccaskill@northgeorgia.edu

Vice-Chair

Dr. Rick Turley
Research Plant Physiologist
USDA-ARS, Jamie Whitten Delta States Research Center
Stoneville, MS 38776
(662) 686-5268
Rick.Turley@ars.usda.gov

Secretary/Treasurer

Dr. Ken Korth
Professor of Plant Pathology
University of Arkansas
Fayetteville, AR 72701
(479) 575-5191
kkorth@uark.edu

SS Representative to ASPB

Dr. Kent Chapman
University of North Texas
Division of Biochemistry & Molecular Biology
Department of Biological Sciences
University of North Texas
Denton TX 76203-5220
E-mail: chapman@unt.edu

Executive Committee Members

Dr. Jay Shockey
USDA-ARS, Southern Regional Research Center
1100 Robert E. Lee Blvd.
New Orleans LA 70124
(504) 286-4296
Jay.Shockey@ars.usda.gov

Dr. Paul Stephenson
Rollins College
Department of Biological Sciences
1000 Holt Ave - 2643
Winter Park FL 32789-4499
(407) 646-2481
pstephenson@rollins.edu

Dr. Rebecca Dickstein
University of North Texas
Department of Biological Sciences
1155 Union Circle, #305220
Denton TX 76203-5017
(940) 565-3359
beccad@unt.edu

Financial Oversight Committee:

Dr. Marc Cohn (mcohn@lsu.edu)
Dr. Kent Chapman (chapman@unt.edu)

Communications Officer:

Dr. Tim Sherman (tshepherd@jaguar1.usouthal.edu)

Southern Section Historian

Dr. Joyce Foster (jgfoster@suddenlink.net)

Elections

Candidates for 2015-2016 offices

The nominations committee (Drs. Becca Dickstein, Paul Stephenson, Jay Shockey, Ashlee McCaskill, and Rick Turley) is putting forward Drs. Nihal Dharmasiri and Deyu Xie for the position of Secretary/Treasurer (2015-2016). Dr. Jay Shockey will run for Executive Committee, Dr. Ashlee McCaskill will run for Chair, and Dr. Rick Turley will run for Vice Chair in the upcoming election by the membership.

Email announcements and instructions will be sent to all SS-ASPB members once the elections are open for voting.

See biographical sketches of candidates for Secretary/Treasurer on the next page.

Candidates for Secretary/Treasurer



Dr. Nihal Dharmasiri received his B.Sc. degree in botany from University of Peradeniya, Sri Lanka, In 1983 he joined Ceylon Institute of Scientific and industrial Research (CISIR), Sri Lanka as a Research Officer in Industrial Microbiology. He continued in this position until 1989. During this period he also completed his M.Phil. degree in the area of plant pathology focusing on "Latent infection of anthracnose disease in papaya caused by Crop Research Institute, England, In 1990, he joined Dr. Michael Harrington's laboratory at University of Hawaii at Manoa to study for his PhD focusing on Ca²⁺/Calmodulin signaling during heat shock response in plants. Then he briefly worked as a postdoctoral research associate with Drs. Winston Su and Samuel Sun at University of Hawaii on a research project related to plant biotechnology to express high value recombinant proteins in plant cell cultures. Nihal later joined Dr, Mark Estelle's laboratory as a postdoctoral research associate and worked with him at University of Texas at Austin, and Indiana University, Bloomington, until 2005. During this period he was successful in identifying TER1 and Its homologs AF8s as auxin receptors, in 2005 he joined the Department of Biology, Texas State University-San Marcos as an Assistant Professor and was promoted to Associate professor in 2011. His research is primarily focused on characterizing auxin response pathway in Arabidopsis. To identify novel genes In auxin response pathway his laboratory carried out Arabidopsis mutant screen using a synthetic auxin analog Picloram, which is structurally somewhat different from other auxins. Characterization of some of these genes has shed light on a link between Ca²⁺calmodulin signaling and plant auxin response. He has been a member of ASPB since 1993. (<http://www.bio.txstate.edu/contacts/faculty/nihal-dharmasiri.html>)



Dr. Deyu Xie is associate professor in the Department of Plant and Microbial Biology at North Carolina State University, Raleigh, NC. He received Doctoral degree in Plant Physiology in 1997 from the Institute of Botany, Chinese Academy of Sciences, Beijing, China. His research interests center on molecular biology and metabolic engineering of plant natural products and pathways in food, medicinal and bioenergy crops. He has published nearly fifty articles in his research area, including *Science*, *Cell*, *Plant Cell* and *Plant Physiology*. He has given nearly fifty talks in conferences and institutions. Dr. Xie is an associate editor of *Planta* and *Advances in Biological Chemistry* journals. He serves the advisor of North Carolina Herbal Association and provides multiple professional services to other professional societies and institutions. He was the guest editor for the special issue entitled "Metabolic Plant Biology" for *Planta*. Dr. Xie was the recipient of the DIAO Distinguished Research Award, Chinese Academy of Sciences, in 1997, and the recipient of the Arthur Neish Young Investigator Award, Phytochemistry Society of North America, in 2009. Dr. Xie was awarded the "Thank A Teacher" honor by North Carolina State University "Thank A Teacher" program in 2012 and 2014 because his teaching has made differences in undergraduate students' lives. Dr. Xie is the current chair of the 53rd annual conference of the Phytochemical Society of North America. (<http://www.cals.ncsu.edu/pmb/Faculty/dxie/dxie.html>)