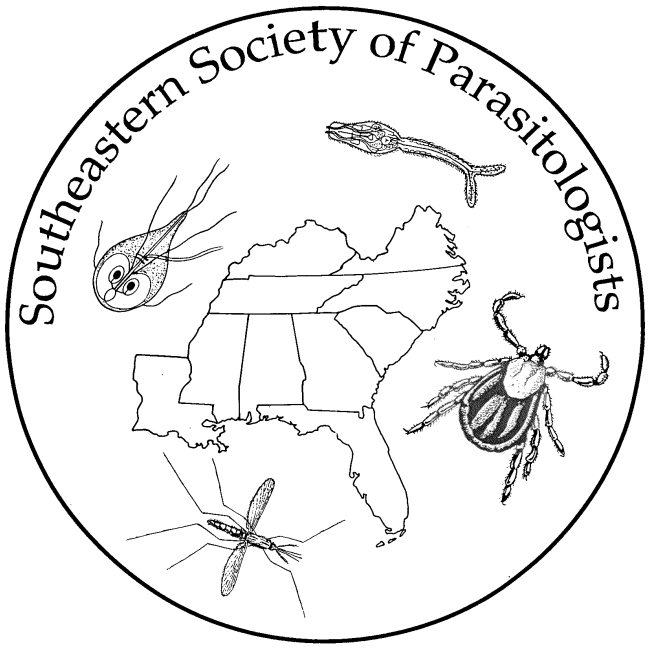
SOUTHEASTERN SOCIETY OF PARASITOLOGISTS

(Affiliate of The American Society of Parasitologists)

PROGRAM AND ABSTRACTS



April 15 – 17, 2009

Hosted by:

Murray State University, Murray, Kentucky

SOUTHEASTERN SOCIETY OF PARASITOLOGISTS

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2004-2006	Isaure De Buron
2007	Michael J. Yabsley
2008-present	Sharon Patton

TRAVEL TO THE KENLAKE RESORT PARK (HOTEL AND PAPER SESSIONS)

From Nashville International Airport (or from south of Murray):

Follow signs I 40 West (to downtown Nashville)
Take I 24 West, exit 211 (to Nashville/Clarksville) – follow approx. 75 miles to first Cadiz exit (exit 65).
Take HWY 68/80 West (exit 65), turn left at the stop sign.
Follow 68/80 approx. 25 miles over a large bridge (Lake Barkley), through the Land Between the Lakes and over a second large bridge (Kentucky Lake).
Approx. ¼ mile after the second bridge, you will see a big sign for the entrance to KenLake Resort Park on your left. Turn in here, continue straight until the end of the road, where you will see the main lodge in front of you.

From North of Murray:

Follow I 24 East to Cadiz, KY
Take HWY 68/80 West (exit 65), turn right at the stop sign.
Follow 68/80 approx. 25 miles over a large bridge (Lake Barkley), through the Land Between the Lakes and over a second large bridge (Kentucky Lake).
Approx. ¼ mile after the second bridge, you will see a big sign for the entrance to KenLake on your left. Turn in here, continue straight until the end of the road, where you will see the main lodge in front of you.

From East (Bowling Green):

Follow 68/80 west thru Russellville and Hopkinsville to Cadiz (take the by-passes around Russellville and Hopkinsville).
Continue on 68/80 approx. 25 miles over a large bridge (Lake Barkley), through the Land Between the Lakes and over a second bridge (Kentucky Lake).
Approx. ¼ mile after the second bridge, you will see a big sign for the entrance to KenLake Resort Park on your left. Turn in here, continue straight until the end of the road, where you will see the main lodge in front of you.

FROM KENLAKE TO HANCOCK BIOLOGICAL STATION (WED. EVENING PRESIDENTIAL SYMPOSIUM AND SOCIAL, THURS EVENING BANQUET AND PARTY).

Turn left on Hwy 68/80 – stay in left lane.
Turn left at first road – HWY 94 West. Go approx. 2.3 miles to HWY 497/Lancaster Rd.
Turn left onto HWY 497, go 1.5 miles (watch out, the road veers left toward the end of the 1.5 miles)
Turn right on Emma Drive, follow Emma until it ends at HBS.

There are signs for HBS starting at the junction of 94 and 497. It may be easier to follow them than the directions!

Emergency Contact Information: Telephone: 270-809-5497 or 270-978-6955. If you are trying to reach HBS – call 270-474-2272.

Weather: The weather in mid-April is usually in the mid 60's to 70s, and can be rainy. Nights in the 50's.

Recreational Activities:
There are canoes and sailboats available at HBS for our use as well as a number of short hikes through the area. The Land Between the Lakes recreational area has numerous hiking, biking and riding trails and the Nature Station with associated activities. Some of the trails are still closed due to the ice-storm in Feb. but the Nature Station, Planetarium and other facilities are open. (http://www.lbl.org/Home.html). Finally, Lake Barkley State Park is a short drive away (http://www.stateparks.com/lake_barkley.html).

Restaurants/dining:

- Breakfast and lunch on Thurs. can be purchased at the restaurant at KenLake Resort.

- Dinner on Wednesday and Thursday as well as brunch (during business meeting) on Friday is included with the meeting registration. In addition, refreshments (including morning donuts and sweet rolls) will be available during the meeting on Thursday.

- There are several good restaurants and bars in Murray, approx. 20 minutes from the meeting site (http://www.mymurray.com/). The 4-counties surrounding us are **DRY** – no alcohol is sold. The exception is in Murray, where you can drink in a bar but can't buy alcohol to take with you. For that, you need to drive S to TN.

Acknowledgement of Program Sponsors: Significant financial support for this meeting has been provided by the Department of Biological Sciences and the College of Science, Engineering and Technology of Murray State University, and Bayer. We greatly appreciate the generous assistance provided by these sponsors.

Southeastern Society of Parasitologists
2009 Program Summary

Meeting Registration/Check In
Wednesday, 15 April 2009, 3:00 – 5:30 p.m
Location: KenLake Resort, in lobby; Continued at Hancock Biological Station after Presidential Symposium.

SSP Executive Committee
Wednesday, 15 April 2009, 4:00 – 5:00 p.m.
Location: Hancock Biological Station Classroom (main building)

SSP Presidential Symposium
Wednesday, 15 April 2009, 6:00 – 8:20 p.m.
Location: Hancock Biological Station

Invertebrate Host-Parasite Interactions: From the Field to the Genes

Presiding: Michael J. Yabsley, Warnell School of Forestry and Natural Resources and Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, University of Georgia. Athens, GA.

6:00 p.m. **Introduction and welcoming remarks**

6:05 p.m. **I. Dana Nayduch.** Georgia Southern University, Statesboro, GA.
TRYPANOSOMATID-FLY INTERACTIONS: PARASITE SURVIVAL TACTICS AND HOST DEFENSIVE RESPONSES

6:50 p.m. **II. Sonia M. Kjos.** Centers for Disease Control and Prevention, Atlanta, GA.
CHARACTERIZATION OF CHAGAS DISEASE TRANSMISSION IN PERIDOMESTIC SETTINGS IN THE SOUTHWESTERN UNITED STATES

7:35 p.m. **III. Jacobus de Roode,** Emory University, Atlanta, GA.
VIRULENCE EVOLUTION IN A PROTOZOAN PARASITE (*OPHRYOCYSTIS ELEKTROSCIRRHA*) OF MONARCH BUTTERFLIES (*DANAUS PLEXIPPUS*)

SSP Presidental Symposium Speakers Reception and Social
Wednesday Evening, 15 April 2009, 8:20 PM.

Location – Hancock Biological Station

PowerPoint Loading Session/Slide Preview.
The program used will be MS PowerPoint 2003 or newer.
Wednesday Evening during Social.
Location – Hancock Biological Station classroom

Thursday Morning, 16 April 2009
Breakfast on own; light fare (continental-style) will be provided at 8:00 a.m. in front of the meeting room.

Contributed Papers Session I
Thursday Morning, 16 April 2009, 8:30 a.m. – 12:00 p.m.
Location – Kentucky Lake Resort Park, main Lodge, below check in.

***Presenting Author**
†Byrd-Dunn Student Paper Competitor

Presiding:
Elizabeth Gleim, University of Georgia
Chad Groce, Auburn University
Kristina Tackett, Western Kentucky University

7:45- 8:15 **Presentation Loading: meeting room, KenLake Lodge.**

8:30 † 1 ***ROELLIG, DAWN M.[1, 2], ANGELA E. ELLIS[3], AND MICHAEL J. YABSLEY[2, 4].** [1]Department of Infectious Diseases, College of Veterinary Medicine; [2]Southeastern Cooperative Wildlife Disease Study, Department of Population Health, College of Veterinary Medicine; [3]Athens Veterinary Diagnostic Laboratory, College of Veterinary Medicine; [4]D.B. Warnell School of Forestry and Natural Resources, The University of Georgia. Oral transmission of *Trypanosoma cruzi* with opposing evidence for the role of carnivory in horizontal transmission.

8:45 † 2 ***BURGER, ASHLEY R., PATRICIA A. O'LEARY, AND OSCAR J. PUNG.** Department of Biology, Georgia Southern University, Statesboro, GA. Optimization of in vitro culture conditions for metacercariae of the digenean, *Microphallus turgidus*.

9:00 † 3 ***MCVAY, MATTHEW J.[1], MICAH D. BAKENHASTER[2], AND STEPHEN A. BULLARD[1].** [1]Department of Fisheries and Allied Aquacultures, Auburn University, Auburn, AL. [2]Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, St. Petersburg, FL. *Cardicola laruei* Short, 1953 (Digenea: Aporocotylidae): Taxonomic redescription, geographic distribution, and potential use as a biological tag in Gulf of Mexico spotted seatrout, *Cynoscion nebulosus* (Sciaenidae) off Mississippi and Florida.

9:15 † 4 ***ROWLAND, MEGHAN E. [1], MICHAEL J. YABSLEY[2], JENNY MALONEY[3], JUNJUN HUANG[1], JOHN R. DUNN[4], L. RAND CARPENTER[4], TIMOTHY F. JONES[4], AND ABELARDO C. MONCAYO[1].** [1]Tennessee Department of Health, Vector-borne Diseases Section, Nashville, TN. [2]Southeastern Cooperative Wildlife Diseases Study, University of Georgia, Athens GA. [3]Department of Biology, Middle Tennessee State University, Murfreesboro, TN. [4]Communicable and Environmental Disease Services, Tennessee Department of Health, Nashville, TN. Seroprevalence of *Trypanosoma cruzi* in canines from Tennessee.

9:30 † 5 ***SHOCK, BARBARA C.[1,2], STACI MURPHY[1], LAURA L. PATTON[3], PHILIP M. SHOCK[4], HOLLY BROWN[5], DAVID S. PETERSON[2], AND MICHAEL J. YABSLEY[1,6]**. [1]Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, University of Georgia, Athens, GA, [2]Department of Infectious Diseases, College of Veterinary Medicine, University of Georgia, Athens, GA, [3]Kentucky Department of Fish and Wildlife Resources, Frankfort, KY, [4]West Virginia Division of Natural Resources, Charleston, WV. [5]Department of Pathology, CVM, UGA, and [6]Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA. Geographic distribution and prevalence of *Cytauxzoon felis* in wild felid reservoirs.

9:45 † 6 ***TACKETT, KRISTINA[1], JUSTIN PADGETT[1], CHAD GROCE[2], AND CHERYL D. DAVIS[1].** Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY, [2]College of Veterinary Medicine, Auburn University, Auburn, AL. Prevalence and diversity of ticks isolated from raccoons and opossums trapped in South Central Kentucky.

10:00 † 7 ***HARRIS, ASHLEY L.[1], JAMESIA SHOWERS[2], ERLE F. CHENNEY[1], AND ANDREA S. VARELA-STOKES[1]**. [1]Department of Basic Science, Mississippi State University, Mississippi State, MS. [2]Tuskegee University School of Veterinary Medicine, Tuskegee, AL. Detection of tick-borne agents from *Amblyomma americanum* (lone star tick) in Mississippi.

10:15 **BREAK: Refreshments provided.**

10:30 † 8 ***SQUIRES, JILL M.[1], ANNE M. ZAJAC[1], JOYCE G. FOSTER[2], AND DAVID S. LINDSAY[1]**. [1]Department of Biomedical Science and Pathobiology, Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA. [2]USDA Agricultural Research Station, Appalachian Farming Systems Research Center, Beaver, WV. The effect of Citroxin™ on experimental *Haemonchus contortus* infection in gerbils (*Meriones unguiculatus*).

10:45 † 9 ***GROCE, CHAD[1], CRYSTAL B. WALKER[2], TARA C. HOLADAY[2], AND CHERYL D. DAVIS[3].** [1]College of Veterinary Medicine, Auburn University, Auburn, AL., [2]Department of Biology, Transylvania University, Lexington, KY, and [3]Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY. *Baylisascaris procyonis* in raccoons trapped in South Central Kentucky.

11:00 † 10 ***BLIZZARD, EMILY L.[1,2], CHERYL D. DAVIS[3], SCOTT HENKE[4], DAVID B. LONG[5], AND MICHAEL J. YABSLEY[1,2].** [1]Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, University of Georgia, Athens, GA, [2]Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA., [3]Department of Biology, Western Kentucky University, Bowling Green, KY, [4]Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, [5]United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, National Wildlife Research Center, Texas Field Station, Texas A&M University-Kingsville, Kingsville, TX. Prevalence and genetic characterization of *Baylisascaris procyonis* from raccoons from Georgia.

11:15 † 11 ***HILSINGER, K. CLAIRE, BRITTANY THOMAS AND DANA NAYDUCH**. Georgia Southern University, Statesboro GA. Analysis of *Skrjabinoptera phrynosoma* infection dynamics on stomach-flushed desert horned lizards (*Phrynosoma platyrhinos*).

11:30 † 12 ***MALONEY, JENNY[1,2] , ANTHONY NEWSOME[1], JUNJUN HUANG[2], JORDONA KIRBY[3], BRETT DUNLAP[3], MICHAEL YABSLEY[4], JOHN R. DUNN[2], L. RAND CARPENTER[2], TIMOTHY F. JONES[2], AND ABELARDO C. MONCAYO[2].** [1]Middle Tennessee State University, [2]Tennessee Department of Health, Vector-Borne Diseases, [3]United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, [4]University of Georgia, Athens. Seroprevalence of *Trypanosoma cruzi* in raccoons in Tennessee.

11:45 † 13 ***VARIKUTI, SANJAY AND CHERYL D. DAVIS**. Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY. Role of endogenous CD4+ CD25+ regulatory T lymphocytes in experimental toxoplasmosis.

12:00 – 1:45 p.m. Lunch Break (on your own)
Location – Kentucky Lake Resort Park Restaurant

1:15-1:45 **PRESENTATION LOADING: meeting room, KenLake Resort Park.**

Contributed Papers Session II

Thursday Afternoon, 16 April 2009, 1:45 p.m. – 3:45 p.m.

Location – Kentucky Lake Resort Park, main Lodge, below check in.

Presiding:

Jenny Maloney, Middle Tennessee State University

Meghan Rowland, Tennessee Department of Health

1:45 † 14 ***FERRELL, MATTHEW B., JAMES A. STOECKEL, AND STEPHEN A. BULLARD**. Department of Fisheries and Allied Aquacultures, Auburn University, Auburn, AL. Taxonomy and histopathology of cercarial infections (Platyhelminthes: Digenea) in yellow sandshells, *Lampsilis teres* (Rafinesque,1820) (Bivalvia: Unionidae) from Line Creek, Alabama, USA

2:00 † 15 ***GLEIM, ELIZABETH AND MICHAEL J. YABSLEY** D.B. Warnell School of Forestry and Natural Resources and Southeastern Cooperative Wildlife Disease Study, Department of Population Health, College of Veterinary Medicine, University of Georgia. Development of a RFLP-PCR assay to distinguish between *Theileria* sp. and *Babesia odocoilei*

2:15 † 16 ***BRAZELTON, CARRIE[1], TODD WALKER[1], BRITTANY CARPENTER[1], CLAIRE A. FULLER[1] AND ROBERT VOLP[2]**. [1]Department of Biological Sciences, Murray State University, Murray, KY, [2] Department of Chemistry, Murray State University. Natural history and immunity in a Caribbean termite: a 10 year study.

2:30 † 17 ***BI, LIPENG[1], CHAD GROCE[2], SANJAY VARIKUTI[1], AND CHERYL D. DAVIS[1]**. Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY 42101. Molecular analysis of *Trypanosoma cruzi* isolates obtained from raccoons in South Central Kentucky.

2:45 † 18 ***GROSS, CHRISTINE M. AND DEREK A. ZELMER.** Department of Biology and Geology, University of South Carolina Aiken, Aiken SC. "Active" passive sampling in two species of *Lepomis* from Par Pond, South Carolina, USA: A case study of infracommunity nestedness.

3:00 **BREAK: Refreshments provided.**

3:15 † 19 ***HSU, VASHA, DAVID C. GRANT, AND DAVID S. LINDSAY**. Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA. Prevalence of IgG antibodies to *Toxoplasma gondii* in cats examined at the Teaching Hospital of the Virginia-Maryland Regional College of Veterinary Medicine.

3:30 † 20 ***SCHOCH, CHRISTINIA[1], JEREMY WODJAK1, AND LISA BELDEN[2]**. Radford University, Blacksburg, VA, 24060, Virginia Tech, Blacksburg, VA 24061. Growth, mortality, and behavior of *Hyla versicolor* tadpoles facing infection by the trematode *Echinostoma trivolvis* and predation by the giant water bug *Belostoma flumineum*.

3:45 † 21 ***GOODWIN, DAVID[1], JEANNINE STROBL[2], THERESA HRUBEC[,1,2,] BRAD KLEIN[1], ANNE ZAJAC[1], AND DAVID S. LINDSAY[1]** [1]Department of Biomedical and Veterinary Science. Virginia Polytechnic Institute. [2]Edward Via Virginia College of Osteopathic Medicine. Blacksburg, Virginia. Effects of dopamine on the development of *Toxoplasma gondii* in cell cultures.

4:00 22 ***RUIZ, CARLOS F.[1], ANDRÉ M. LANDRY[1], AND STEPHEN A. BULLARD[2].** [1]Sea Turtle and Fisheries Ecology Research Laboratory, Texas A&M University at Galveston, Galveston, TX. [2]Department of Fisheries and Allied Aquacultures, Auburn University, Auburn, AL. Host specificity among congeneric monogeneans infecting congeneric, sympatric sharks: Prevalence of *Dermophthirius penneri* and *Dermophthirius maccallumi* (Monogenea: Microbothriidae) on the skin of blacktip sharks (*Carcharhinus limbatus*) and bull sharks (*Carcharhinus leucas*) in the Northern Gulf of Mexico.

4:15 23 ***LEWIS, S. ROCHELLE[1], SIOBHAN P ELLISON[2], JOHN J DASCANIO[1], DAVID S LINDSAY[3], ROBERT M GOGAL[3], STEPHEN R WERRE[3], NAVEEN SURENDRAN[1], BETTINA HEID[1], MEGHAN E BREEN[4], FRANK M ANDREWS[5], VIRGINIA A BUECHNER-MAXWELL[1] AND SHARON G WITONSKY[1].** [1]Large Animal Clinical Sciences, Virginia-Maryland Regional College of Veterinary Medicine (VMRCVM), Blacksburg, VA. [2]Pathogenes Inc, PO Box 970, Fairfield, FL. [3]Biomedical Sciences and Pathobiology, VMRCVM, Blacksburg, VA. [4]Ross University School of Veterinary Medicine, PO Box 334, Basseterre, St Kitts, West Indies. [5]Equine Director, School of Veterinary Medicine, Veterinary Teaching Hospital and Clinics, Louisiana State University, Baton Rouge, LA. Experimental infection with *Sarcocystis neurona* alters the immune response: the effect on CD4, CD8, B cell and granulocyte populations in horses.

4:30 **D. Bruce Conn: update as president of the American Society of Parasitologists**

4:35-6:00 **Enjoy the surroundings – take out a canoe at Hancock Biological Station**

6:00 **Dinner and other activities, Hancock Biological Station.**

Friday Morning, 17 April 2009
If you want breakfast before the 10:00 a.m. business meeting/brunch, then it is on your own

Contributed Papers Session III
Friday Morning, 17 April 2009, 8:30 a.m. – 10:15 a.m.
Location – Kentucky Lake Resort Park
*Presenting Author

Presiding:
David Goodwin, Virginia-Maryland Regional College of Veterinary Medicine

7:45- 8:15 **Presentation Loading, meeting room, KenLake Resort Park**

8:30 24 ***DE BURON, ISAURE[1], DYKOVÁ, IVA[2], IVAN FIALA[2], AND WILLIAM A. ROUMILLAT[3]**. [1] Department of Biology, College of Charleston, SC, [2]Institute of Parasitology, Biology Centre of the Academy of Sciences of the Czech Republic, Ceské Budejovice, Czech Republic. [3]Marine Resources Division, SC Department of Natural Resources, Charleston SC. Myxosporean infection in the skeletal muscle of the spotted seatrout.

8:45 25 ***ZELMER, DEREK A., CHRISTINE M. GROSS, AND HOLLI E. PENDER**. Department of Biology and Geology, University of South Carolina Aiken, Aiken, SC. Evaluating the potential for parasites to indicate ecosystem-level changes in the Edisto River, SC.

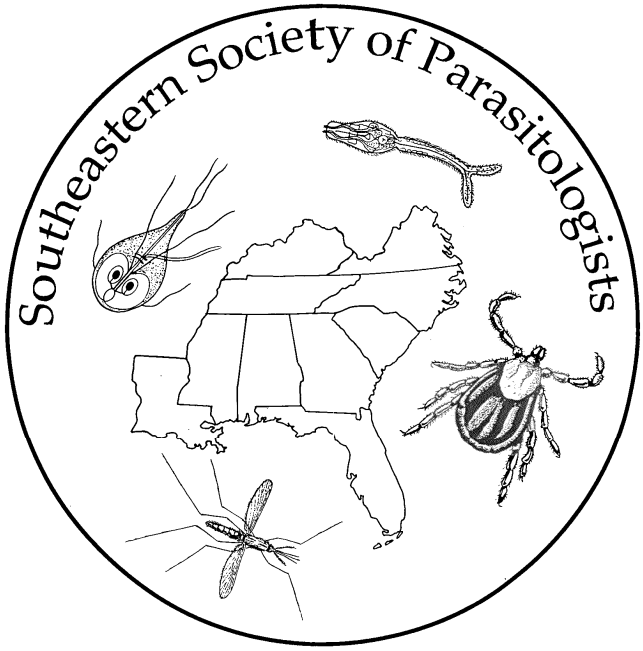
9:00 26 ***O'HEAR, MARY[1], LINDA POTE[1], MARLENA YOST[1], BARBARA GEORGE[1], CYNTHIA DOFFITT[1], LESTER KHOO[1,3], DAVID WISE[2] AND CARLA PANUSKA[1]** [1]College of Veterinary Medicine, Mississippi State University, MS 39762; [2]Mississippi Agricultural and Forestry Experiment Station, Thad Cochran National Warmwater Aquaculture Center, Stoneville, MS 38776; [3]Aquatic Diagnostic Laboratory, Thad Cochran National Warmwater Aquaculture Center, Stoneville, MS 38776. An overview of host-parasite interactions of the digenetic trematode, *Bolbophorus damnificus*.

9:15 27 ***KAYES, S. G**. University of South Alabama, Mobile AL. Teaching biology with the virtual microscope.

9:30 28 **GERHOLD, RICHARD W. [1,2], MICHAEL J. YABSLEY*[1,3], JENNIFER C. WESTER[4], AND JEFF L. LARKIN[4]** Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, The University of Georgia[1] Department of Poultry Sciences, The University of Georgia[2] Warnell School of Forestry and Natural Resources, The University of Georgia[3], Department of Biology, Indiana University of Pennsylvania– Survey and molecular characterization of *Sarcocystis* spp. from skeletal muscle of free-ranging fishers from Pennsylvania.

9:45 29 ***LINDSAY, DAVID S[1], GEORGE J. FLICK[2], DAVID GOODWIN[1], VASHA HSU[1], AND J. P. DUBEY[3]**. [1]Department of Biomedical Sciences and Pathobiology, Virginia Tech, Blacksburg, VA; [2]Department of Food Science and Technology, Virginia Tech, Blacksburg, VA, and [3]USDA, ARS, ANRI, Animal Parasitic Diseases Laboratory, BARC-East, Beltsville, MD. Effects of high pressure processing on sporulation and infectivity of *Toxoplasma gondii* oocysts for mice.

SSP Business Meeting and Brunch
Friday Morning, 17 April 2009, 10:00 a.m.
Location – Kentucky Lake Resort Park, Room TBA



PROGRAM ABSTRACTS

S1. **NAYDUCH, DANA.** Department of Biology, Georgia Southern University, Statesboro, GA. Trypanosomatid-fly interactions: parasite survival tactics and host defensive responses.

Historically, many studies have focused on the interactions of trypanosomatid parasites and their vertebrate hosts in an effort to identify possible targets for treatments or cures. However, in the wake of increasing prevalence of both drug-resistant parasite strains and failing strategies for vector control, an increasing amount of research has emerged which investigates these parasites in their invertebrate hosts (e.g., vectors). Trypanosomatids such as *Trypanosoma* and *Leishmania* face a challenging environment within their insect hosts (flies, bugs) and have evolved strategies for surviving and persisting in these vectors. Invertebrate hosts have defensive barriers, both physical and physiological, that must be negotiated and/or averted by parasites in order to complete their life cycle. Physical barriers include protective structures such as the peritrophic matrix in the midgut. Physiological defenses are more diverse, and include digestive enzymes in the midgut and immune response effector molecules, such as antimicrobial peptides. There is a delicate balance between parasite propagation/survival and the timing of host defensive responses that will determine the ultimate end of this interaction. Examples from the literature will be discussed, with particular focus on trypanosomatids that reside in upper-level dipteran hosts. Additionally, parasite-host interactions in heteroxenous systems will be compared to that of monoxenous (ancestral) systems. Topics to be discussed include the role of parasite surface molecules in the survival and propagation within the insect midgut, the effect of temporal expression of antimicrobial responses on trypanosomatid symbionts, and the impact of these interactions on the fitness of insect vectors.

S2. **KJOS, SONIA[1], MICHAEL J. YABSLEY[2], ELLEN DOTSON[1], PAULA MARCET[1], DAWN ROELLIG[2], EMILY BLIZZARD[2], JOHN BARNES[3], URIEL KITRON[4].** [1]Centers for Disease Control and Prevention, Atlanta, GA; [2]University of Georgia, Athens, GA; [3]Southwest Texas Veterinary Medical Center, Uvalde, TX; [4]Emory University, Atlanta, GA. Characterization of Chagas Disease transmission in peridomestic settings in the southwestern United States.

Evidence for an established sylvatic Chagas disease transmission cycle in the U.S. is well documented, but the transmission dynamics, including spillover into the peridomestic setting are not well understood. Domestic dogs in the U.S. are associated with both the parasite and the vectors, but the predominant transmission route to dogs and the reservoir potential of dogs in peridomestic settings are unknown. To better characterize the peridomestic transmission cycle in the southwestern U.S., triatomine bugs and wild mammals were sampled from residential sites with and without *T. cruzi*-infected dogs. A total of 131 bugs were collected from eight sites with an infection prevalence of 83% by PCR analysis. Triatomine infection prevalence was similar at sites with and without infected dogs. Five species of triatomine bugs were identified among specimens collected, with *Triatoma gerstaeckeri* and *T. sanguisuga* the predominant species. Blood meal analysis of bug gut contents by DNA sequencing of a segment of the cytochrome *b* gene identified dogs, humans, cats, woodrats, and cattle as the primary blood hosts. Wild mesomammals were targeted for trapping at three of the residential sites with dogs. A total of 96 animals were trapped and sampled including woodrats, raccoons, skunks, squirrels, and small rodents. *T. cruzi* strains type I and II were isolated in blood cultures from five species of wild mammals. *T. cruzi* appears to be highly prevalent in insect vectors, wild mammals, and domestic dogs in the study area. The results provide evidence that U.S. triatomine species utilize humans and domestic dogs and cats as blood hosts. The close association of infected vectors with dogs and cats detected in this study provides evidence for an active peridomestic Chagas disease transmission cycle in the southwestern U.S. that may present a risk for autochthonous human transmission.

S3. **DE ROODE, JACOBUS**. Emory University, Atlanta, GA. Virulence evolution in a protozoan parasite (*Ophryocystis elektroscirrha*) of monarch butterflies (*Danaus plexippus*).

Why do parasites cause disease? Theory has shown that natural selection could select for virulent parasites if virulence is correlated with between-host parasite transmission. Because ecological conditions may affect virulence and transmission, theory further predicts that adaptive levels of virulence depend on the specific environment in which hosts and parasites interact. To test these predictions in a natural system, we study monarch butterflies (*Danaus plexippus*) and their protozoan parasite (*Ophryocystis elektroscirrha*). Our studies have shown that more virulent parasites obtain greater between-host transmission, and that parasites with intermediate levels of virulence obtain highest fitness. The average virulence of wild parasite isolates falls closely to this optimum level, providing additional support that virulence can evolve as a consequence of natural selection operating on parasite transmission. Our studies have also shown that parasites from geographically separated populations differ in their virulence, suggesting that population-specific ecological factors shape adaptive levels of virulence. One important ecological factor is the monarch larval host plants in the milkweed family. Monarch populations differ in the milkweed species they harbor, and experiments have shown that milkweeds can alter parasite virulence. Our running hypothesis is that plant availability shapes adaptive levels of parasite virulence in natural monarch populations. Testing this hypothesis will improve our understanding of why some parasites are more harmful than others, and will help with predicting the consequences of human actions on the evolution of disease.

1. **ROELLIG, DAWN M.[1, 2], ANGELA E. ELLIS[3], AND MICHAEL J. YABSLEY[2, 4].** [1]Department of Infectious Diseases, College of Veterinary Medicine; [2]Southeastern Cooperative Wildlife Disease Study, Department of Population Health, College of Veterinary Medicine; [3]Athens Veterinary Diagnostic Laboratory, College of Veterinary Medicine; [4]D.B. Warnell School of Forestry and Natural Resources, The University of Georgia. Oral transmission of *Trypanosoma cruzi* with opposing evidence for the role of carnivory in horizontal transmission.

Maintenance of *Trypanosoma cruzi*, the causative agent of Chagas' disease, in native US wildlife populations increases the potential for zoonotic transmission in North America. While considerable research has been conducted on the molecular evolutionary ecology of *T. cruzi* in recent years, transmission studies pertaining to the sylvatic cycle are limited. In the southeastern US, only two vectors (*Triatoma* spp.) are present; however, the prevalence of *T. cruzi* in raccoons (*Procyon lotor*) and opossums (*Didelphis virginiana*) can be high. To investigate an alternative non-vector-based transmission method, we tested the hypothesis that raccoons scavenging infected hosts can result in infection. Macerated tissue from selected organs infected with the amastigote stage of *T. cruzi* was orally administered to experimental groups of raccoons (n=2/group) at 2, 12, or 24 hours after collection of the tissue samples. Additionally, raccoons in control groups were inoculated intravenously (n=2) or *per os* (n=1) with trypomastigotes. To further elucidate transmission routes of *T. cruzi* to raccoons, infected *Rhodnius prolixus* were fed to raccoons (n=2). Attempts to detect minicircle kDNA from blood and tissue, seroconversion and parasitemias revealed that no raccoons became infected after ingestion of amastigote-infected tissues. However, *per os* transmission can occur by ingestion of the infective trypomastigote stage or infected reduviid bugs. We can conclude from these findings that oral transmission of *T. cruzi* may be a route of infection for wildlife in sylvatic cycles, but the scavenging behavior of animals is a limited factor.

2. **BURGER, ASHLEY R., PATRICIA A. O'LEARY, AND OSCAR J. PUNG.** Department of Biology, Georgia Southern University, Statesboro, GA. Optimization of in vitro culture conditions for metacercariae of the digenean, *Microphallus turgidus*.

Previous experiments in our laboratory determined that metacercariae of *Microphallus turgidus* mature into adults and deposit eggs infectious to hydrobiid snails, when cultured in air at 42°C in RPMI-1640 supplemented with 20% horse serum. The purpose of the present study was to vary culture conditions (i.e., serum and glucose concentrations, gas phase, and incubation time prior to cultivation) to optimize production of viable, infective eggs and worm survival. To do so, excysted metacercariae from grass shrimp, *Palaemonetes pugio*, were incubated in saline for 0-48 h in conical bottom tubes and then cultured in 24-well plates (5 worms/well) at 42°C. Worms produced the greatest number of eggs when incubated for 24 h in a conical bottom tube prior to cultivation. Serum concentrations of 20-40% were optimal with respect to both number of eggs produced and survival. Glucose concentrations of 0.5-2% had no effect on egg production or worm survival, though 3% glucose decreased the number of eggs deposited. Worms deposited more eggs and survived longer when cultured in 5% CO_2 rather than air. Worms cultured in anaerobic conditions died sooner and produced fewer eggs, than worms in 5% CO_2 or air, even when the medium was supplemented with glucose. No treatment had a dramatic effect on the percentage of normal, embryonated eggs. Experiments are in progress to determine the effect of culture conditions on infectivity of eggs to hydrobiid snails. We conclude that metacercariae produce more eggs and survive longer when incubated 24 h in conical bottom tubes and then cultured in RPMI-1640 containing at least 20% horse serum in a gas phase of 5% CO_2.

3. **MCVAY, MATTHEW J.[1], MICAH D. BAKENHASTER[2], AND STEPHEN A. BULLARD[1].** [1]Department of Fisheries and Allied Aquacultures, Auburn University, Auburn, AL. [2]Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, St. Petersburg, FL. *Cardicola laruei* Short, 1953 (Digenea: Aporocotylidae): Taxonomic redescription, geographic distribution, and potential use as a biological tag in Gulf of Mexico spotted seatrout, *Cynoscion nebulosus* (Sciaenidae) off Mississippi and Florida.

The ten provisionally-accepted species of *Cardicola* infect the heart and other large blood vessels of marine and estuarine fishes of several families, including the drums (Sciaenidae), in the Pacific Ocean, Atlantic Ocean, and Gulf of Mexico. Only four species of *Cardicola* reportedly range in the Gulf of Mexico, and none have been reported since the original description. Hence, little is known about their morphological features, host specificity, and geographic distributions. In specific, adults of *Cardicola laruei* infect the heart of sand weakfish, *Cynoscion arenarius* (Sciaenidae) (type host) and spotted seatrout *Cynoscion nebulosus* off Alligator Harbor, FL (type locality). We herein 1) redescribe *C. laruei* with type and newly-collected specimens, contributing to a systematic revision of *Cardicola*, 2) document infection prevalence among seatrouts in the Gulf of Mexico, 3) report a new geographic locality record for *C. laruei* (Tampa Bay, FL), and 4) consider the utility of *C. laruei* as a biological tag distinguishing putative populations of *C. nebulosus* in the Northern and Eastern Gulf of Mexico. Flukes were observed alive before being heat-killed under slight coverslip pressure and fixed in 10% neutral buffered formalin for morphology or placed directly in 95% molecular-grade ethanol for molecular biology. A few gill filaments from each seatrout were examined as wet-mounts for the presence of fluke eggs. Flukes were stained in Van Cleave's and Ehrlich's hematoxylins before being measured with an ocular micrometer and illustrated with the aid of a compound microscope equipped with a camera lucida and differential interference contrast (DIC) optical components.

4. ROWLAND, MEGHAN E. [1], MICHAEL J. YABSLEY[2], JENNY MALONEY[3], JUNJUN HUANG[1], JOHN R. DUNN[4], L. RAND CARPENTER[4], TIMOTHY F. JONES[4], AND ABELARDO C. MONCAYO[1]. [1]Tennessee Department of Health, Vector-borne Diseases Section, Nashville, TN. [2]Southeastern Cooperative Wildlife Diseases Study, University of Georgia, Athens GA. [3]Department of Biology, Middle Tennessee State University, Murfreesboro, TN. [4]Communicable and Environmental Disease Services, Tennessee Department of Health, Nashville, TN. Seroprevalence of *Trypanosoma cruzi* in canines from Tennessee.

Trypanosoma cruzi, the causative agent of Chagas' disease, is endemic in the southeastern United States. Although research has been done to demonstrate the prevalence among mammals in the southeastern United States, little has been done to describe the pathogen's occurrence in canines. In this study over 800 canine serum samples were collected through collaboration with veterinary clinics from 30 counties in Tennessee, representing the largest study of its type in the Southeast. The samples were tested for antibodies to *T. cruzi* using indirect fluorescent antibody (IFA) assays. We report an overall seroprevalence of 6.4% (55/860) among canines in Tennessee. Because canines exhibit persistent parasitemia and frequently live in close proximity to humans, they may play a larger role in the transmission of Chagas' disease among humans and animals in Tennessee.

5. SHOCK, BARBARA C.[1,2], STACI MURPHY[1], LAURA L. PATTON[3], PHILIP M. SHOCK[4], HOLLY MOORE-BROWN[2], DAVID S. PETERSON[2], AND MICHAEL J. YABSLEY[1,5]. [1]Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, University of Georgia, Athens, GA, [2]Department of Infectious Diseases, CVM, UGA, Athens, GA, [3]Kentucky Department of Fish and Wildlife Resources, Frankfort, KY, [4]West Virginia Department of Natural Resources, Parkersburg, WV. [5]Warnell School of Forestry and Natural Resources, UGA, Athens, GA. Geographic distribution and prevalence of *Cytauxzoon felis* in wild felid reservoirs.

Cytauxzoon felis, a tick-borne protozoal parasite of wild and domestic felids, is the causative agent of cytauxzoonosis in some domestic and exotic felids. *C. felis* is transmitted by two tick species, *Dermacentor variabilis* and *Amblyomma americanum*, whose distribution overlap throughout the Southern US. But, *D. variabilis* ranges farther into northern tier states. The objective of the current project was to determine the distribution and prevalence of *C. felis* in bobcats (*Lynx rufus*) and other wild/exotic felids from six eastern states (KS, KY, LA, ND, OK, and WV). The bobcat is believed to be the primary reservoir for *C. felis*, but few studies have looked at the distribution and prevalence of the parasite within wild felids. Spleen samples from hunter-killed felids (n=187) were tested for *C. felis* by PCR targeting the ribosomal internal transcribed spacer (ITS) region and sequence analysis. Our preliminary data indicates that prevalence was significantly higher in southern states where both tick species are present. The prevalence in KS (n=35 bobcats), KY (29), LA (1 bobcat, 1 cougar [*Felis concolor*], 1 serval [*Leptailurus serval*]), and OK (20) was 26%, 41%, 33%, and 60%, respectively. The prevalence was lower in WV (0%, 23) and ND (5%, 77). These data indicate that *C. felis* is widespread in bobcats, but there were spatial differences in prevalence which may relate to the distributions of the two tick species. The ultimate goal is to investigate intraspecific variability of *C. felis* throughout the US by comparison of ITS sequences from wild felids with those in domestic cats.

6. TACKETT, KRISTINA[1], JUSTIN PADGETT[1], CHAD GROCE[2], AND CHERYL D. DAVIS[1]. [1]Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY, [2]College of Veterinary Medicine, Auburn University, Auburn, AL. Prevalence and diversity of ticks isolated from raccoons and opossums trapped in South Central Kentucky.

The incidence of tick-borne zoonoses such as Ehrlichiosis, Rocky Mountain Spotted Fever, and Lyme Disease has steadily increased in the southeastern United States in recent years. According to the CDC, the southeastern states accounted for 1,223 cases of the 27,444 total reported Lyme Disease cases in the US in 2007. Although *Ixodes scapularis* is the most commonly recognized vector for *Borrelia burgdorferi*, the causative agent of Lyme disease, *Dermacentor variabilis* (a common vector for Rocky Mountain Spotted Fever) also has been shown to be a viable host for this pathogen. The goal of the present study was to evaluate the potential for raccoons and opossums to serve as reservoir hosts for tick-borne diseases in Kentucky. Raccoons and opossums were trapped in Barren and Warren counties of Kentucky between June 2007 and June 2008. Ticks were removed and stored in 70% ethanol. A total of 1,097 ticks were collected. Three different species were obtained from raccoons; *D. variabilis*, *Amblyomma* sp., and *Ixodes* sp. *D. variabilis* was the only tick species found on opossums. DNA has been isolated from ticks using Qiagen mini kits and PCR optimization using *B. burgdorferi* strain B31 genomic DNA and primer sets specific for the flagellin gene and 16S rRNA gene has been successful. Partial support of NIH Grant Number 2P20RR-16481 from the National Center for Research Resources is gratefully acknowledged.

7. HARRIS, ASHLEY L.[1], JAMESIA SHOWERS[2], ERLE F. CHENNEY[1], AND ANDREA S. VARELA-STOKES[1]. [1]Department of Basic Science, Mississippi State University, Mississippi State, MS. [2]Tuskegee University School of Veterinary Medicine, Tuskegee, AL. Detection of tick-borne agents from *Amblyomma americanum* (lone star tick) in Mississippi.

Amblyomma americanum, the lone star tick, is the most common tick in the Southeast. It is a vector for bacteria such as *Borrelia lonestari*, putative agent of "southern tick-associated rash illness" (STARI), *Ehrlichia chaffeensis*, causative agent of human monocytic ehrlichiosis, *Ehrlichia ewingii*, a causative agent of human granulocytic ehrlichiosis, *Francisella tularensis*, the agent of tularemia, and also may carry the rickettsiae *Rickettsia amblyommii*, and potentially *Rickettsia. parkeri*, both implicated as human disease agents. This study evaluated the prevalence of these bacterial agents in lone star ticks in Mississippi. We collected over 700 adult *A. americanum* from four regions of Mississippi: Northeast, Northwest, Southeast, and East. Of the ticks collected, 192 were dissected and the DNA was extracted for nested PCR assays. In all, 2.6% of ticks had evidence of *Borrelia* sp., 3.6% for *E. chaffeensis*, 6.3% for *E. ewingii*, and 43.2% for a *Rickettsia* species. Most *Rickettsia* sp. detected was found to be *R. amblyommii* by sequencing. In addition, 42 pools containing a total of 950 larval *A. americanum* were tested for the presence of *E. chaffeensis* and *Rickettsia* species, all of which were *R. amblyommii*. Nine out of 42 (21.4%) pools were PCR positive for *Rickettsia amblyommii*. This study demonstrates *E. chaffeensis*, *E. ewingii*, *Borrelia* spp., and *R. amblyommii* in *A. americanum* by PCR for the first time in Mississippi. Understanding the epidemiology of these agents in Mississippi should increase awareness of tick-borne disease in the medical community. This work was funded by a Research Initiation Program grant (Mississippi State University) and the Office of Research and Graduate Studies (College of Veterinary Medicine, MSU).

8. SQUIRES, JILL M.[1], ANNE M. ZAJAC[1], JOYCE G. FOSTER[2], AND DAVID S. LINDSAY[1]. [1]Department of Biomedical Science and Pathobiology, Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA. [2]USDA Agricultural Research Station, Appalachian Farming Systems Research Center, Beaver, WV. The effect of Citroxin™ on experimental *Haemonchus contortus* infection in gerbils (*Meriones unguiculatus*).

Haemonchus contortus is a blood-sucking abomasal parasite responsible for major losses to small ruminant producers worldwide. Resistance of this nematode to commercial anthelmintics has produced a demand for alternative control methods. Citroxin™, an orange oil formulation with known activity against plant parasitic nematodes, was assessed for activity against *H. contortus* in a gerbil model. In all experiments, gerbils were infected with 600 infective third-stage *H. contortus* larvae. In one experiment, gerbils were treated with 600 mg/kg orange oil (4 ml/kg Citroxin™) once or daily for five days. In a second experiment, gerbils were treated with 1200 mg/kg orange oil (8 ml/kg Citroxin™) once or daily for five days. On day 9 post-infection, gerbils were killed, their stomachs removed, and the worms counted. The lower dosage of Citroxin™ caused 7% and 62% parasite reduction compared to an untreated control group when given once or daily for five days, respectively. The higher dosage of Citroxin™ caused 25% and 88% parasite reduction compared to an untreated control group when given once or daily for five days, respectively. Analysis of variance and Tukey's test revealed a significant difference between groups in both experiments ($P < 0.005$). Citroxin™ may be an effective alternative to commercial dewormers. Further studies are being conducted in sheep to evaluate Citroxin™ against adult *H. contortus* in a natural host.

9. GROCE, CHAD[1], CRYSTAL B. WALKER[2], TARA C. HOLADAY[2], and CHERYL D. DAVIS[3]. [1]College of Veterinary Medicine, Auburn University, Auburn, AL., [2]Department of Biology, Transylvania University, Lexington, KY, and [3]Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY. *Baylisascaris procyonis* in raccoons trapped in South Central Kentucky.

The large raccoon roundworm, *Baylisascaris procyonis*, has recently emerged as a potential zoonotic pathogen of humans. The incidence of human infection with this dangerous parasite is expected to increase as raccoon populations continue to expand into peri-domestic habitats. The purpose of our study was to determine the prevalence of *B. procyonis* infection in raccoons trapped from Warren and Barren counties of Kentucky. Raccoons were live-trapped between June 2007 and January 2008. Following inhalant anesthesia with isoflurane, fresh fecal samples were removed and placed into specimen bags. An overdose of isoflurane was then given to ensure death, and intestines were removed and examined for the presence of intestinal parasites. Helminths were removed with forceps and placed into vials containing 70% ethanol. In the laboratory, parasite eggs were separated from fecal matter using a sodium nitrate fecal flotation/centrifugation method. Parasite eggs were observed, identified, and photographed using an Olympus BX51 microscope. The overall prevalence of *B. procyonis* infection in raccoons was 36%. Prevalence was highest in Barren County, with nearly 50% of raccoons positive for the parasite. NIH Grant 2 P20 RR-16481 from the National Center for Research Resources is gratefully acknowledged.

10. *BLIZZARD, EMILY L.[1,2], CHERYL D. DAVIS[3], SCOTT HENKE[4], DAVID B. LONG[5], AND MICHAEL J. YABSLEY[1,2]. [1]Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, University of Georgia, Athens, GA, [2]Warnell School of Forestry and Natural Resources, University of Georgia, Athens, GA., [3]Department of Biology, Western Kentucky University, Bowling Green, KY, [4]Caesar Kleberg Wildlife Research Institute, Texas A&M University–Kingsville, Kingsville, TX, [5]United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, National Wildlife Research Center, Texas Field Station, Texas A&M University-Kingsville, Kingsville, TX. Prevalence and genetic characterization of *Baylisascaris procyonis* from raccoons from Georgia.

Historically, *Baylisascaris procyonis*, a parasitic intestinal nematode commonly found in raccoons (*Procyon lotor*), has been absent from the southeastern United States. In 2002, the parasite was first documented in Georgia (Atlanta, DeKalb County). The goal of this study was to investigate potential spread in Georgia. Intestinal tracts of 156 raccoons were examined for *B. procyonis*; 105 from Clarke County and 51 from Chatham County. Nine of 105 (8.6%) raccoons from Clarke County were infected with *B. procyonis* and two raccoons were infected with large ascarids identified as *Toxascaris leonina*, a common parasite of dogs/cats. None of the raccoons from Chatham County were infected with ascarids. To possibly identify a geographic location where the Georgia *B. procyonis* population may have come from, we amplified and sequenced regions of the rRNA gene. Since only a single sequence of each gene was available in genbank, we obtained preserved worms from raccoons from Kentucky and Texas for comparison. To date, ITS-1 sequences have been successfully obtained from 15 worms from Georgia (n=6), Kentucky (n=4), and Texas (n=6). Although numerous polymorphic bases were observed among the samples, none were associated with a particular geographic location. ITS-2 sequences obtained from six samples from Georgia, Kentucky, and Texas were 100% identical. Similarly, 18S and 5.8S rRNA gene sequences were conserved among all samples. These data indicate that the distribution of *B. procyonis* within Georgia is increasing and that limited genetic variation in the rRNA and ITS gene regions is present among widely distributed populations of *B. procyonis*.

11. HILSINGER, K. CLAIRE, BRITTANY THOMAS AND DANA NAYDUCH. Georgia Southern University, Statesboro GA. Analysis of *Skrjabinoptera phrynosoma* infection dynamics on stomach-flushed desert horned lizards (*Phrynosoma platyrhinos*).

Skrjabinoptera phrynosoma is a spirurid nematode stomach parasite of the desert horned lizard *Phrynosoma platyrhinos*. The life cycle involves *Pogonomyrmex* spp. harvester ant as intermediate host, which collects the gravid female worm after she has exited the lizard via the cloaca. The *Pogonomyrmex* spp. forager feeds the worm to larval ants, which as adults carry infective L3 worms. The life cycle continues when infected ants are eaten by the lizard definitive host. What remains unknown are the worm burden dynamics in lizards that contribute to this life cycle. *P. platyrhinos* from the Alvord basin were stomach-flushed during three collection periods (early/middle/late) throughout the 2008 active season. Number and length of female, male, and juvenile worms from flushes were analyzed and correlated with lizard SVL (snout-vent length). In addition, mean numbers of worms (male, female, juvenile, and total worms) per lizard host were analyzed across season. There was a positive correlation between lizard SVL and total worm number throughout the season, as well as a positive correlation between lizard SVL and female worm length in early season. There was no significant difference between mean worm number (including males, females, and juveniles) in early, middle, and late season, but the mean number of female worms was significantly greater in early season than in late season. These data illustrate seasonality in the infection dynamics of female *S. phrynosoma* in *P. platyrhinos.* Thanks to the Georgia Southern University Professional Development Fund.

12. **MALONEY, JENNY[1,2] , ANTHONY NEWSOME[1], JUNJUN HUANG[2], JORDONA KIRBY[3], BRETT DUNLAP[3], MICHAEL J. YABSLEY[4], JOHN R. DUNN[2], L. RAND CARPENTER[2], TIMOTHY F. JONES[2], AND ABELARDO C. MONCAYO[2].** Middle Tennessee State University, [2]Tennessee Department of Health, Vector-Borne Diseases, [3]United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, [4]University of Georgia, Athens. Seroprevalence of *Trypanosoma cruzi* in raccoons in Tennessee.

Trypanosoma cruzi is the causative agent of Chagas disease and infects 8 to 11 million people in Latin America. Although the parasite is known to be present in Tennessee, little is known about the ecology and risk of transmission of *T. cruzi* among humans and animals. We tested raccoon serum for the presence of antibodies to *T. cruzi* using the indirect fluorescent antibody (IFA) assay to better understand the presence, transmission dynamics, and infection risk of *T. cruzi* in Tennessee. To date, 704 samples have been tested representing 10 counties. Two hundred and seven (29.4%) samples were seropositive. Nine counties have yielded raccoon serum that is positive for antibodies to *T. cruzi*, ranging from 14.6-63.6% seroprevalence per county. Seven kissing bugs (*Triatoma sanguisuga)*, 5 from DeKalb County and 2 from Davidson County, were tested for the presence of *T. cruzi* using PCR. Four of the seven (57%), two from each county, were PCR positive for *T. cruzi*. Since *T. sanguisuga* has been documented to be capable of vectoring both *T. cruzi* I and *T. cruzi* IIa, *T. cruzi* DNA will be analyzed via PCR to determine the type of *T. cruzi* present in the infected *T. sanguisuga*. The infected kissing bugs are a vector of *T. cruzi*, and peridomestic raccoons may serve as a reservoir for *T. cruzi*. Raccoons and kissing bugs are potentially a source of exposure risk for humans and domestic mammals.

13. **VARIKUTI, SANJAY AND CHERYL D. DAVIS**. Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY. Role of endogenous CD4+ CD25+ regulatory T lymphocytes in experimental toxoplasmosis.

T regulatory (Treg) cells play an important role in the immune system by controlling the activity of other T lymphocytes. These cells are differentiated from other T lymphocyte populations based on the co-expression of CD4 and CD25 and expression of the Foxp3 gene. In several infectious disease models, it has been demonstrated that some pathogens are able to increase their survival in the host by exploiting T reg cell activity. However, the role of T reg cells during infection with *T. gondii* has not been determined. In the present study we have investigated the role of Treg cells during murine infection with the ME49 strain of *T. gondii*. In vivo depletion of Treg cells was accomplished by injecting mice with a monoclonal antibody (mAb) isolated from the 7D4 rat hybridoma cell line. This mAB is specific for the interleukin-2 receptor alpha chain (also known as CD25). Female Swiss mice approximately 8 weeks of age were depleted of Tregs by i.p injection of 400µg of mAb, on both 7 days and 1 day prior to infection with 20 tissue cysts of *T. gondii*. Preliminary results suggest that depletion of Treg cells has little measurable impact during the acute stage of infection with *T. gondii*. Further studies will be required to determine the impact of Treg depletion has on tissue cyst burden and histopathology during the chronic stage of murine *T. gondii* infection. NIH Grant 2 P20 RR-16481 from the National Center for Research Resources is gratefully acknowledged.

14. **FERRELL, MATTHEW B., JAMES A. STOECKEL, AND STEPHEN A. BULLARD**. Department of Fisheries and Allied Aquacultures, Auburn University, Auburn, AL. Taxonomy and histopathology of cercarial infections (Platyhelminthes: Digenea) in yellow sandshells, *Lampsilis teres* (Rafinesque,1820) (Bivalvia: Unionidae) from Line Creek, Alabama, USA

We document the histopathological effects of a digenean on its first intermediate host the yellow sandshell, *Lampsilis teres* in Line Creek (Lee County, Alabama, USA). Although it is well documented that larval digeneans (sporocyst, redia) typically castrate the molluscan first intermediate host in marine waters, there is a paucity of published information documenting how these larvae affect the health and reproduction of freshwater mussels (Unionidae). In specific, we know of no detailed histopathological report that documents the host-parasite relationship that exists between any digenean and the yellow sandshell or any unionid in the southeastern United States. Our objectives were to identify the cercaria, quantify prevalence of infection (5 of 65 infected, 0.08), and use routine histology to document the specific site of infection and the pathological changes to the visceral mass, which includes digestive tubules and gonad. Freshwater mussels were collected by hand from Line Creek and maintained alive until being examined for the presence of metazoan parasites. Cercariae were photographed and observed alive prior to being heat-killed and stored in 10% neutral buffered formalin or fixed alive in 95% molecular-grade ethanol. Histology samples (anterior adductor muscle, posterior adductor muscle, digestive tubules, foot, gill, gonad, labial palps, and mantle) were immersed in Davidson's fixative for 36 hours before routine processing and paraffin embedding.

15. **GLEIM, ELIZABETH AND MICHAEL J. YABSLEY** D.B. Warnell School of Forestry and Natural Resources and Southeastern Cooperative Wildlife Disease Study, Department of Population Health, College of Veterinary Medicine, University of Georgia. Development of a RFLP-PCR assay to distinguish between *Theileria* sp. and *Babesia odocoilei*

Two intraerythrocytic piroplasm parasites, *Babesia odocoilei* and a *Theileria* sp., are found in white-tailed deer throughout the eastern United States. *B. odocoilei* is a significant cause of disease in some species of cervids and bovids; however, diagnosis is complicated because this parasite is morphologically similar to the *Theileria* sp. that commonly infects white-tailed deer and elk (often erroneously referred to as *T. cervi*). In the current study we developed a RFLP-PCR assay that can detect and provide a definitive diagnosis of either *B. odocoilei* or the *Theileria* sp. In addition, because these parasites are transmitted by different ticks and prevalence rates based on blood-smear analysis in past studies has been very high, we hypothesize that the distribution of these two parasites can be used to infer the distribution of their respective vectors (which transmit numerous pathogens to domestic animals and humans). This assay was used to test white-tailed deer from throughout the Southeast to determine the prevalence and distribution of both *B. odocoilei* and *Theileria* sp. To date, blood samples (n=168) from white-tailed deer from AR, FL, GA, MD, MS, KY, NC, SC, and WV were tested. Both parasites were common, with 80.4% prevalence for *Theileria* sp. and 11.9% for *B. odocoilei*. In general, the distribution of the two piroplasms was in agreement with their known vector distributions with *Theileria* sp. infections occurring throughout the southern states and *B. odocoilei* prevalence being highest in Maryland. This assay will be useful for the diagnosis of clinical piroplasmosis and was recently used to diagnose the first clinical case of theileriosis in captive reindeer from Alabama.

16. BRAZELTON, CARRIE[1], TODD WALKER[1], BRITTANY CARPENTER[1], CLAIRE A. FULLER[1] AND ROBERT VOLP[2]. [1]Department of Biological Sciences, Murray State University, Murray, KY, [2] Department of Chemistry, Murray State University. Natural history and immunity in a Caribbean termite: a 10 year study.

Termites are highly important in recycling of woody debris into soils, particularly in tropical ecosystems. Termites are social organisms, living in colonies of up to 500,000 individuals. Living in social groups increases the risk of contracting infectious diseases. This, in conjunction with human-induced problems such as climate change and habitat degradation, could negatively affect the termites, and therefore, soil production. Previous short-term research showed that temperature and humidity affect reproduction, survival, aspects of immunity and susceptibility to fungal disease in the Caribbean termite, *Nasutitermes acajutlae*. To determine the magnitude of these affects, we conducted a 10-year study on the island of St. John, USVI. We measured the relationship between abiotic climate variables including light, soil moisture, soil temperature, relative humidity and temperature inside and out of selected nests, and biotic variables: survival, growth and reproduction of termite colonies. We are also further examining how their immune system is affected by their habitat. Previous research documented that one aspect of termite immunity (phenoloxidase activity) increases with temperature, as does susceptibility to fungal infections. To determine the affect of habitat on a second aspect of immunity, we are examining fat content of termite bodies taken from the multiple microclimates. We will present the relationship between environmental conditions and termite survival, growth, reproduction and immunity. This study provides insight into how climate change might affect soils and wood recycling in tropical ecosystems.

17. BI, LIPENG[1], CHAD GROCE[2], SANJAY VARIKUTI[1], AND CHERYL D. DAVIS[1]. Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY 42101. Molecular analysis of *Trypanosoma cruzi* isolates obtained from raccoons in South Central Kentucky.

Although *T. cruzi* has been isolated from a variety of wild mammals, particularly in the southeastern United States, it has only recently been identified in raccoons and opossums in the state of Kentucky. Eighteen isolates of *T. cruzi* were successfully obtained from raccoon blood samples by hemoculture in LIT medium supplemented with 10% newborn calf serum and penicillin/streptomycin. The purpose of the present study was to use a previously published molecular typing approach to determine the genotypes (type I, or types IIa-IIe) of 13 of the 18 isolates. DNA samples were prepared from each isolate using a Qiagen mini kit, and PCR amplification was performed using published primers for the 24S a rRNA sequence (D71 and D72), the non-transcribed spacer of the mini-exon genes (TC, TC1, and TC2), the 18S rRNA sequence (V1 and V2), and the TCZ1 and TCZ2 primers that amplify a 188-base pair segment of the repetitive 195-bp nuclear DNA sequence of *T. cruzi*. Based upon the results of this analysis, all 13 isolates appear to be Type IIa, the genotype of *T. cruzi* that has been most commonly reported from raccoons in the southeastern part of the United States. The support of NIH Grant Number 2 P20 RR-16481 from the National Center for Research Resources is gratefully acknowledged.

18. **GROSS, CHRISTINE M. AND DEREK A. ZELMER**. Department of Biology and Geology, University of South Carolina Aiken, Aiken SC. "Active" passive sampling in two species of *Lepomis* from Par Pond, South Carolina, USA: A case study of infracommunity nestedness.

The effects of ontological diet shifts on the nestedness of parasite infracommunities of *Lepomis gulosus* and *Lepomis macrochirus* were examined at two localities, Hot Dam and Cold Dam, in Par Pond, SC. Fill-constrained, occurrence-constrained, and abundance-constrained null models were used to evaluate the degree of nestedness. The presence-absence matrix for the infracommunities of both species of fish at each site had significantly fewer discrepancies than the matrices produced by the fill-constrained model, and none had significantly fewer discrepancies than the occurrence-constrained null model. Only the infracommunities of *L. gulosus* from the Cold Dam had significantly fewer discrepancies than the matrices produced by the abundance-constrained model. The nestedness of the four component communities was not more than that expected under a passive sampling mechanism. A positive correlation between host size and total abundance of parasites indicates that infracommunities of *L. gulosus* and *L. macrochirus* are nested as the result of the increased probability of older, larger fish encountering individuals of less common species simply because they have sampled a larger number of parasite individuals.

19. **HSU, VASHA, DAVID C. GRANT, AND DAVID S. LINDSAY**. Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA. Prevalence of IgG antibodies to *Toxoplasma gondii* in cats examined at the Teaching Hospital of the Virginia-Maryland Regional College of Veterinary Medicine.

Felidae play an important role in the transmission of *Toxoplasma gondii* to warm-blood vertebrates as the definitive host that contaminates the environment with oocysts in their feces.
The prevalence of IgG antibodies in domestic, well cared for, cats has not been examined in detail. We are interested in examining the prevalence of *T. gondii* in cats with renal disease compared to cats with no renal disease. This is important due to the fact that renal disease is a critical condition in cats and renal transplants in these animals are increasing as veterinarians become familiar with the procedure. Cat plasma/serum was obtained from feline patients at the teaching hospital of VMRCVM. Samples were examined blinded to presenting clinical signs in an indirect immunofluorescent antibody (IFA) test at a dilution of 1:25 for antibodies to tachyzoites of the RH strain of *T. gondii*. Of the 61 samples 18 (29.5 %) were positive for IgG antibodies. Information on renal disease in these cats is presently being tabulated. Additionally selected samples were examined at a 1:25 dilution for IgG antibodies to *Tritrichomonas foetus* and *Trypanosoma cruzi*. The majority of these samples exhibited fluorescence. We believe that this reaction is a false positive due to the large number of positive samples.

20. SCHOCH, CHRISTINIA[1], JEREMY WODJAK[1], AND LISA BELDEN[2]. Radford University, Blacksburg, VA, 24060, Virginia Tech, Blacksburg, VA 24061. Growth, mortality, and behavior of *Hyla versicolor* tadpoles facing infection by the trematode *Echinostoma trivolvis* and predation by the giant water bug *Belostoma flumineum*.

Trematode parasites commonly infect tadpoles and often persist through metamorphosis. This infection can lead to lower growth rates, morphological differences including limb deformation, and higher mortality rates. In addition, infection may lead to behavioral changes that may alter an individual's risk of predation. Thus, the well-studied effects of predation risk on tadpole behavior may be mediated by parasite infection status and/or intensity. We conducted an experiment crossing in a full-factorial design tadpole's perceived predation risk (caged giant water bug *Belostoma flumineum* predators consuming tadpoles*)* with parasite infection (the trematode *Echinostoma trivolvis*) using gray tree frog tadpoles (*Hyla versicolor)*. All of these species co-occur in ponds in Virginia. We filled sixteen 38 L microcosms with well-water and added to each 5g of dry mixed hardwood leaves, algae, and six infected or uninfected *Hyla* tadpoles. Each microcosm contained a cage with either a *Belostoma* predator and two non-infected tadpoles (replaced daily) or two non-infected tadpoles. Microhabitat use of the tadpoles in each environment was monitored daily until water clarity prevented effective observation. Tadpoles were removed for staging, weighing and dissection as their forelimbs emerged, or at the termination of the experiment (after 42 days). We found no significant effects of predation risk or parasite infection on growth, mortality, metamorphosis or behavior.

21. GOODWIN, DAVID[1], JEANNINE STROBL[2], TERRY HRUBEC[,1,2,] BRADLEY KLEIN[1], ANNE ZAJAC[1], AND DAVID S. LINDSAY[1] [1]Department of Biomedical and Veterinary Science. Virginia Polytechnic Institute. [2]Edward Via Virginia College of Osteopathic Medicine. Blacksburg, Virginia. Effects of dopamine on the development of *Toxoplasma gondii* in cell cultures.

Toxoplasma gondii is an obligate intracellular parasite. *Toxoplasma gondii* is capable of infecting every warm-blooded animal. Infection with *T. gondii* in the intermediate host has two phases, the acute phase of infection where it disseminates throughout the body and the chronic phase when it encysts in all tissues with neural tissue of the brain being a frequent location. Traditional thought is there are no adverse side effects of chronic *T. gondii* infection because there is little to no reaction around tissue cysts. Research has shown a correlation between prevalence of antibody titers to *T. gondii* and psychological illness in humans. Recent research has shown a correlation between people with psychotic disorders, schizophrenia, bipolar disease and *T. gondii* infection. These disorders have been associated with changes in the dopamine neurotransmitter system. Dopamine in the brain may play a role in proliferation/chemotraction of *T. gondii*. The link between mental illness and *T. gondii* infection is not 100%, however, there is a strong correlation between the two, indicating *T. gondii* infection could be an environmental factor for some mental disorders whose effect is mediated through changes in the dopamine system. Research in rodents with toxoplasmosis has indicated alterations in cognitive learning, fear response, and overall open field activity. Some of these behavior changes can be related to altered neurotransmitter levels, in specific dopamine. In an in vitro cell culture assay dopamine was tested against developing tachyzoites. To address the hypothesized effects of dopamine in *T. gondii* infection, ddopamine was tested at 2 concentrations, 100 nM and 250 nM. An increase of tachyzoite proliferation and increased destruction in cell monolayer was observed at both concentrations. The highest concentration, 250 nM, yielded the greatest increase in tachyzoites proliferation.

22. RUIZ, CARLOS F.[1], ANDRÉ M. LANDRY[1], AND STEPHEN A. BULLARD[2]. [1]Sea Turtle and Fisheries Ecology Research Laboratory, Texas A&M University at Galveston, Galveston, TX. [2]Department of Fisheries and Allied Aquacultures, Auburn University, Auburn, AL. Host specificity among congeneric monogeneans infecting congeneric, sympatric sharks: Prevalence of *Dermophthirius penneri* and *Dermophthirius maccallumi* (Monogenea: Microbothriidae) on the skin of blacktip sharks (*Carcharhinus limbatus*) and bull sharks (*Carcharhinus leucas*) in the Northern Gulf of Mexico.

Host specificity is an integral biological characteristic of parasites regarding both disease management and natural history. Although flatworms can be specialists (infecting few hosts) or generalists (infecting many hosts), little is known about host specificity of ectoparasitic flatworms of marine apex predators. *Dermophthirius* spp. infect the skin of carcharhinid sharks of the Atlantic Ocean, Indian Ocean, and Gulf of Mexico, and they are occasionally identified as etiological agents of debilitating skin disease in aquarium-held sharks. *Dermophthirius penneri* reportedly infects the skin of blacktip sharks (*Carcharhinus limbatus*) and spinner sharks (*Carcharhinus brevipinna*) in the Northwestern Atlantic Ocean and Gulf of Mexico whereas *Dermophthirius maccallumi* reportedly infects bull sharks (*Carcharhinus leucas*) in the Gulf of Mexico and Central America. Towards elucidating microbothriid host specificity, we gathered infection prevalence data for *D. penneri* and *D. maccallumi*. Sharks were captured by hook and line and examined for the presence of microbothriids before being tagged, measured, and released alive. We sampled 225 sharks representing 10 species of 3 genera: blacknose shark, *Carcharhinus acronotus* [9]; *C. brevipinna* [27]; finetooth shark, *Carcharhinus isodon* [5]; *C. leucas* [21]; *C. limbatus* [97]; sandbar shark, *Carcharhinus plumbeus* [4]; sharpnose shark, *Rhizoprionodon terraenovae* [33]; scalloped hammerhead shark, *Sphyrna lewini* [13]; smooth hammerhead shark, *Sphyrna zygaena* [8]; and bonnethead shark, *Sphyrna tiburo* [8]. Of those, *D. penneri* and *D. maccallumi* only infected each blacktip and bull shark sampled, respectively. These preliminary results suggest *D. penneri* and *D. maccallumi* are highly host specific and represent useful biological tags for these frequently-misidentified coastal sharks.

23. LEWIS, S. ROCHELLE[1], SIOBHAN P ELLISON[2], JOHN J DASCANIO[1], DAVID S LINDSAY[3], ROBERT M GOGAL[3], STEPHEN R WERRE[3], NAVEEN SURENDRAN[1], BETTINA HEID[1], MEGHAN E BREEN[4], FRANK M ANDREWS[5], VIRGINIA A BUECHNER-MAXWELL[1] AND SHARON G WITONSKY[1]. [1]Large Animal Clinical Sciences, Virginia-Maryland Regional College of Veterinary Medicine (VMRCVM), Blacksburg, VA. [2]Pathogenes Inc, PO Box 970, Fairfield, FL. [3]Biomedical Sciences and Pathobiology, VMRCVM, Blacksburg, VA. [4]Ross University School of Veterinary Medicine, PO Box 334, Basseterre, St Kitts, West Indies. [5]Equine Director, School of Veterinary Medicine, Veterinary Teaching Hospital and Clinics, Louisiana State University, Baton Rouge, LA. Experimental infection with *Sarcocystis neurona* alters the immune response: the effect on CD4, CD8, B cell and granulocyte populations in horses.

Equine Protozoal Myeloencephalitis (EPM) is a common neurologic disease of equines in the United States, and is predominantly caused by the protozoan *Sarcocystis neurona*. A compromised immune system may be responsible for the development of clinical disease in certain exposed animals. Previous studies have demonstrated differences in CD4, CD8 and B cell populations between EPM affected and normal horses, and have highlighted the role of IFNγ and the adaptive immune response. Reasons behind these differences are not yet known. Nine naïve, immunocompetent horses were obtained. Baseline neurologic examinations and SAG1 ELISAs were performed on CSF and serum. Horses were randomly divided into control and infected groups. Five horses were challenged with *S neurona* via intravenous injection of autologous lymphocytes. Neurologic parameters of all horses were assessed for 70 days following infection. Lymphocytes were stimulated with antigen-specific and non-specific mitogens, and differences assessed through thymidine incorporation. Enumeration of cellular subsets, degree of apoptosis and number of cellular divisions were assessed through flow cytometry. SAG1 ELISA of serum and CSF performed post-infection confirmed infection and disease. All affected horses became moderately neurologic. This constitutes the first time Ellison's model has been reproduced successfully by different investigators. There were no significant differences in lymphocyte proliferation responses between control and infected groups. This is in contrast to previous studies. Flow cytometric data is still being analyzed and results will be presented at the meeting. Preliminary analyses demonstrate some significant differences, particularly amongst neutrophil and monocyte cell subsets. Grants: Patricia Bonsall Stuart Foundation, Virginia Horse Industry Board

24. DE BURON, ISAURE[1], IVA DYKOVÁ[2], IVAN FIALA[2], AND WILLIAM A. ROUMILLAT[3]. [1] Department of Biology, College of Charleston, SC, [2]Institute of Parasitology, Biology Centre of the Academy of Sciences of the Czech Republic, Ceské Budejovice, Czech Republic. [3]Marine Resources Division, SC Department of Natural Resources, Charleston SC. Myxosporean infection in the skeletal muscle of the spotted seatrout.

Spores of myxosporeans were found infecting the skeletal muscles of the spotted seatrout *Cynoscion nebulosus* in South Carolina. Prevalence of infection was high (79%) and the pathogenic potential assessed and confirmed histologically. Light microscopy and ultrastructural characters rank this species in the group of *Kudoa* species with simple-shaped spores. The uniqueness of the SSU and LSU rDNA sequences justifies its status as a new species. Since the spotted seatrout is a fish of great importance economic in the southeastern USA, further studies to determine this species' life cycle, host specificity, and extent of its deleterious effect on its host are deemed necessary.

25. ZELMER, DEREK A., CHRISTINE M. GROSS, AND HOLLI E. PENDER. Department of Biology and Geology, University of South Carolina Aiken, Aiken, SC. Evaluating the potential for parasites to indicate ecosystem-level changes in the Edisto River, SC.

Indicators of ecosystem change must reflect deeply embedded processes. The functional relationship between the presence of a parasite in a given host and foodweb structure suggests that parasite communities have the potential to be excellent multifactorial measures of ecosystem change. This potential was examined by sampling fish, benthic invertebrates, and the parasites of a locally abundant and regionally common fish host (*Lepomis auritis*) at 5 localities on the north fork, 4 localities on the south fork, and 4 localities along the main branch of the Edisto River in South Carolina. The Edisto River is unimpounded, producing progressive, related changes in the physical and chemical and chemical properties along its length that are reflected in the composition of the invertebrate and fish communities. Patterns of parasite component community similarity were examined using nonmetric multidimensional scaling, and the resultant ordination compared to hypothetical topologies representing different determinants of community structure using Procrustes analysis. The pattern of parasite component community similarity corresponded more closely to those of the fishes and benthic invertebrates than to topologies that reflected geographical and hydrological structuring, or fine-grained and course-grained habitat differences. Separate consideration of gill parasites revealed a strong coincidence with the pattern of fish community structure. Although evaluation of the interrelatedness of these systems will require examination of changes over time, coincidence in the patterns of parasite communities and host communities suggest that parasites have the potential to reflect ecosystem-level changes.

26. O'HEAR, MARY[1], LINDA POTE[1], MARLENA YOST[1], BARBARA GEORGE[1], CYNTHIA DOFFITT[1], LESTER KHOO[1,3], DAVID WISE[2] AND CARLA PANUSKA[1] [1]College of Veterinary Medicine, Mississippi State University, MS; [2]Mississippi Agricultural and Forestry Experiment Station, Thad Cochran National Warmwater Aquaculture Center, Stoneville, MS; [3]Aquatic Diagnostic Laboratory, Thad Cochran National Warmwater Aquaculture Center, Stoneville, MS. An overview of host-parasite interactions of the digenetic trematode, *Bolbophorus damnificus.*

The digenetic trematode *Bolbophorus damnificus* in commercial catfish has been a challenge to control as large numbers of fish-eating birds, many of which are heavily infected with this parasite, are constantly present on catfish ponds. To understand the biology and ultimately develop control strategies for *B. damnificus,* a series of studies were done on: its life cycle; the population dynamics of its snail host, *Planorbella trivolvis*; and the interaction of this parasite with its hosts. Life cycle studies confirmed: the hosts were the American white pelican (AWP), the channel catfish, the snail (*P. trivolvis*) and a newly reported snail host, *Biomphalaria havanensis*. *Bolbophorus damnificus* reached patency in the AWP 4-7 d post-infection, trematode ova hatched in 12-53 d, cercariae were shed by *P. trivolvis* 23 d post-infection, and metacercariae were mature in catfish 23 d post-infection. Snail studies demonstrated that: *P. trivolvis* overwinter in pond temperatures as low as 5º C with reproduction occurring year-round; 0.8% of *P. trivolvis* populations in ponds are infected with *B. damnificus*; and infected snails shed 3,200 cercariae/day and continue shedding for 21 d. Pathology studies showed that mortalities of 20-100% occurred day 6 post-infection with 200 cercariae/fish. Metacercariae were present in the subcutaneous muscle, the dermis, the muscular layers in the urinary bladder and the heart. Preliminary snail surveys have shown other cercariae types are shed from both *P. trivolvis* and *B. havanensis*. Studies are underway to determine their pathogenicity in channel catfish.

27. **KAYES, S. G**. University of South Alabama, Mobile AL. Teaching biology with the virtual microscope.

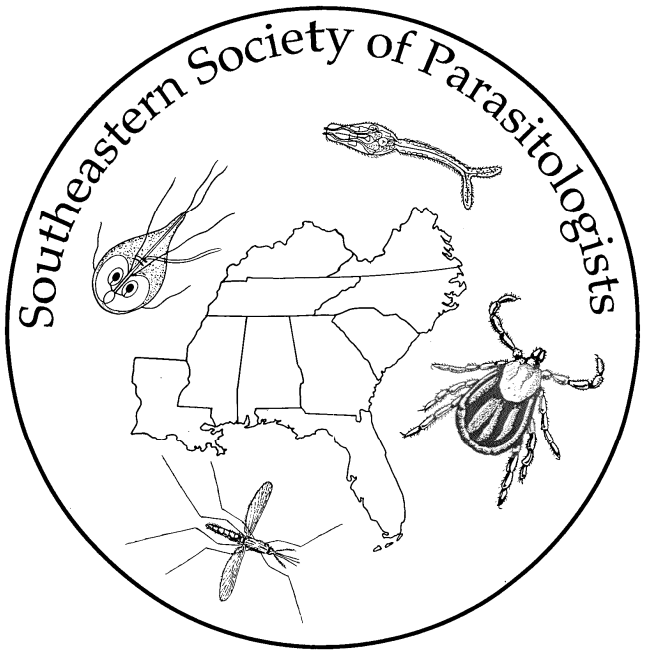
Microscopes continue to be a staple of the biological teaching laboratory and their acquisition costs have only gone up in recent years. Real microscopes have associated costs including maintenance and storage. Slide collections can be an additional cost. Student microscopes are not usually supplied with cameras or other associated microscopic tools. Students have to be present in the laboratory to study or review. My Department has recently implemented a commercial virtual microscope (vScope) program distributed by Bacus Laboratories. Our students download a free desktop applet and can view a slide collection that I manage remotely on a server located at our computer center. Students can study slides from anywhere they have access to the internet. Given a choice of using the vScope or the real thing, our students prefer the benefits of the vScope. The Bacus vScope will be demonstrated in real time and the pros and cons of the implementation and our learning curve will be discussed. Some examples of student presentations will also be available to view.

28. **GERHOLD, RICHARD W. [1,2], MICHAEL J. YABSLEY[1,3], JENNIFER C. WESTER[4], AND JEFF L. LARKIN[4]** Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, The University of Georgia[1] Department of Poultry Sciences, The University of Georgia[2] Warnell School of Forestry and Natural Resources, The University of Georgia[3], Department of Biology, Indiana University of Pennsylvania– Survey and molecular characterization of *Sarcocystis* spp. from skeletal muscle of free-ranging fishers from Pennsylvania.

In 2003, clinical meningoencephalitis caused by *Sarcocystis neurona* was diagnosed in a free-ranging fisher (*Martes pennanti*) from Garrett County, Maryland. Multiple mature sarcocysts consistent with *S. neurona*, which were not associated with inflammation, were scattered throughout the skeletal muscle. To determine the prevalence of *Sarcocystis* spp. in fishers and determine if fishers are a potential intermediate host for *S. neurona*, DNA was extracted from 0.5g of skeletal muscle from 30 fishers collected as part of research project in Central and Western Pennsylvania. The 18S small subunit rRNA gene of *Sarcocystis* spp. was amplified by PCR from the extracted DNA using primers 18S9L and 18S1H. Twenty-seven (90%) of the fishers were positive for *Sarcocystis* spp. and of the positive samples, nine (33.3%) were PCR positive from DNA extracted from thoracic limb muscle, six (22.2%) were positive from DNA extracted from pelvic limb muscle, and twelve (44.4%) were positive from DNA extracted from both thoracic and pelvic limb muscle. Nucleotide sequencing was performed on a subset (eight) of the amplicons and compared to available sequences in GenBank. All eight *Sarcocystis* spp. sequences were similar and shared a 98.3-99.1% nucleotide identity to a *Sarcocystis* sp. from a white-fronted goose (*Anser albifrons*). It is likely that the *Sarcocystis* from the fishers represent a previously undescribed species. Further surveys and molecular analysis will be performed on additional samples.

29. LINDSAY, DAVID S[1], GEORGE J. FLICK[2], DAVID GOODWIN[1], VASHA HSU[1], AND J. P. DUBEY[3]. [1]Department of Biomedical Sciences and Pathobiology, Virginia Tech, Blacksburg, VA; [2]Department of Food Science and Technology, Virginia Tech, Blacksburg, VA, and [3]USDA, ARS, ANRI, Animal Parasitic Diseases Laboratory, BARC-East, Beltsville, MD. Effects of high pressure processing on sporulation and infectivity of *Toxoplasma gondii* oocysts for mice.

Oocysts of *Toxoplasma gondii* are environmentally resistant stages. Humans can become infected by accidentally ingesting the oocysts in water or on contaminated produce. Severe disease can occur in immunocompromised individuals and non-immune pregnant women can infect their offspring. Chronic infection is associated with decreased mental functions, vision and hearing problems and as well as some mental disorders such as schizophrenia. High pressure processing (HPP) is a commercial method used to treat food to eliminate pathogens. The present experiments were done to determine the effects of HPP on sporulation and infectivity of *T. gondii* oocysts. Nonsporulated oocysts of *T. gondii* were exposed to 550 MPa, 480 MPa, 400 MPa, 340 MPa, 270 MPa, 200 MPa, 140 MPA, 100 MPa, or no MPa (1 MPa = 10 atm = 147 psi) treatment for 60 sec in a commercial HPP unit. Visual inspection of oocysts indicated that 200 MPa or > for 60 sec was sufficient to inactivate all oocysts. Results of bioassay in mice and dose titration of MPa exposure are pending.



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