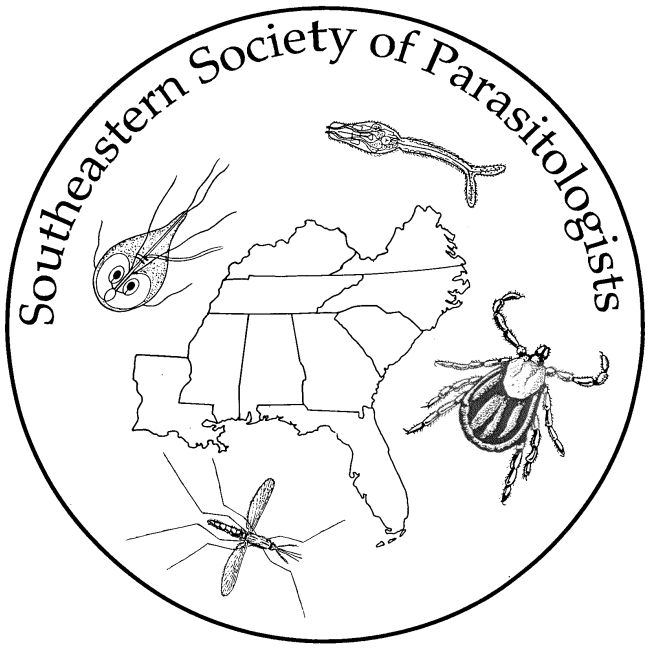
SOUTHEASTERN SOCIETY OF PARASITOLOGISTS

(Affiliate of The American Society of Parasitologists)

PROGRAM AND ABSTRACTS



April 11 – 13, 2007

Hosted by:

College of Charleston, Charleston, SC
and the
University of South Carolina-Upstate, Georgetown, SC

SOUTHEASTERN SOCIETY OF PARASITOLOGISTS

Officers 2006-2007

President: Jennifer Spencer
President - Elect: Claire A. Fuller
Past-President: Malcolm E. Powell
Vice-President: Michael J. Yabsley
Council Representative: Isaure De Buron
Secretary-Treasurer: Sharon Patton

Former Officers

President

1969	Elon E. Byrd
1970	Burton J. Bogitsh
1971	Robert B. Short
1972	Felix H. Lauter
1973	James H. Oliver, Jr.
1974	A. B. Weathersby
1975	Reinard Harkema
1976	Gerald W. Esch
1977	John V. Ernst
1978	John McCall
1979	Grover C. Miller
1980	Kenneth C. Corkum
1981	Sharon Patton
1982	Raymond E. Kuhn
1983	John P. Harley
1984	Jeffrey A. Butts
1985	Gayle P. Noblet
1986	John R. Seed
1987	William B. Lushbaugh
1988	Leon W. Bone
1989	Robert W. Edwards
1990	Stephen G. Kayes
1991	Michael D. Stuart
1992	William F. Font
1993	Byron L. Blagburn
1994	Larry S. Roberts
1995	Leon F. Duobinis-Gray
1996	Robin M. Overstreet
1997	John M. Aho
1998	David S. Lindsay
1999	D. Bruce Conn
2000	George W. Benz
2001	Cheryl D. Davis
2002	Oscar Pung
2003	Vincent A. Connors
2004	Charles T. Faulkner
2005	Malcolm E. Powell

Vice-President

1969	Richard E. Bradley
1970	Gerald W. Benz
1971	Raymond L. Kisner
1972	James S. McDaniel
1973	John V. Ernst
1974	Gerald W. Esch
1975	John V. Aliff
1976	Grover C. Miller
1977	Kenneth C. Corkum
1978	Vernon Powders
1979	Raymond E. Kuhn
1980	Jeffrey A. Butts
1981	Larry R. McDougald
1982	William L. Current
1983	Gayle P. Noblet
1984	William C. Grant
1985	William B. Lushbaugh
1986	Leon W. Bone
1987	Robert W. Edwards
1988	Michael D. Stuart
1989	Rick L. Tarleton
1990	J. Ed Hall
1991	Byron L. Blagburn
1992	Larry N. Gleason
1993	Robin M. Overstreet
1994	John M. Aho
1995	David S. Lindsay
1996	D. Bruce Conn
1997	George W. Benz
1998	Cheryl D. Davis
1999	Vincent A. Connors
2000	Charles T. Faulkner
2001	Claire A. Fuller
2002	Vina Diderrich-Faulkner
2003	Jennifer Spencer
2004	Isaure De Buron
2005	Edwin C. Rowland

Secretary-Treasurer

1969-1986	Mary C. Dunn
1987-	Sharon Patton

Council Representative

1970-1971	G. W. Hunter III
1972	Henry W. Leigh
1973-1974	A.B. Weathersby
1975	Richard Harkema
1976	Gerald W. Esch
1977-1980	Robert B. Short
1981-1983	Gerald W. Esch
1984-2000	Sharon Patton
2001-2003	Edwin C. Rowland
2004 -	Isaure De Buron

Acknowledgement of Program Sponsor: Significant financial support for this meeting has been provided by the Department of Biology of the College of Charleston and from the College of Arts and Sciences of the University of South Carolina Upstate. Registration expenses for presenters in the Byrd-Dunn Student Paper Competition were reimbursed through a generous grant from Bayer Animal Health, Shawnee Mission, KS. We greatly appreciate the generous assistance provided by these sponsors.

Travel to the Belle Baruch Station

From Charleston International Airport:

Coming out of the Airport you will be going EAST on INTERNATIONAL BLVD toward AIR CARGO LN (2.0 miles). Merge onto I-526 E via the ramp on the LEFT toward MT PLEASANT / I-26 (11.3 miles). Take the LONG POINT ROAD exit- EXIT 28 (0.2 miles). Turn LEFT onto LONG POINT RD (3.1 miles). Turn LEFT onto N US-17 / US-17 N / US-701 N. Continue to follow US-17 N / US-701 N to Georgetown (50.2 miles). Once in Georgetown, you will pass over the Sampitt River and go through four traffic lights. STAY IN THE RIGHT-HAND LANE AND FOLLOW SIGNS TO THE BEACHES -- 17 NORTH WILL VEER TO THE RIGHT. As you leave Georgetown you will cross two rivers. After crossing the second bridge (crosses Waccamaw River and AIWW), watch for the entrance to Hobcaw Barony approximately one mile on the right. The Baruch Marine Field Laboratory is located on Hobcaw Barony.

From Myrtle Beach, SC:

Follow Highway 17 South (Bypass 17 is recommended). About eight miles south of the traffic light in Pawley's Island, begin looking for DeBordieu Colony on the left. After passing the DeBordieu turnoff you will find the Baruch Marine Field Laboratory (located on Hobcaw Barony) turn off approximately 0.3 mile on the left. Look for the "Hobcaw Barony" sign.

From Savannah, GA:

Take I-95 N into South Carolina (36.9 miles from Savannah, GA.). Merge onto US-17 N via EXIT 33 toward CHARLESTON / BEAUFORT (61.7 miles). Turn SLIGHT LEFT onto US-17 N / CROSSTOWN. Continue to follow US-17 N (1.2 miles). Merge onto US-17 N via EXIT 220B toward MT PLEASANT / GEORGETOWN (59.2 miles). Once in Georgetown, you will pass over the Sampitt River and go through four traffic lights. STAY IN THE RIGHT-HAND LANE AND FOLLOW SIGNS TO THE BEACHES -- 17 NORTH WILL VEER TO THE RIGHT. As you leave Georgetown you will cross two rivers. After crossing the second bridge (crosses Waccamaw River and AIWW), watch for the entrance to Hobcaw Barony approximately one mile on the right. The Baruch Marine Field Laboratory is located on Hobcaw Barony.

From Charlotte, NC:

Take I-77 S toward COLUMBIA (Crossing into SOUTH CAROLINA -100 miles). Merge onto I-26 E via the exit on the LEFT toward CHARLESTON (96.9 miles). Take the I-526 exit- EXIT 212B-C- toward SAVANNAH / MT PLEASANT. Merge onto I-526 E via EXIT 212C on the LEFT toward MT PLEASANT (12.2 miles). Take the US-17 N exit- EXIT 29- toward GEORGETOWN (0.7 miles). Turn LEFT onto N US-17 / US-17 N / US-701 N. Continue to follow US-17 N / US-701 N (52.6 miles). Once in Georgetown, you will pass over the Sampitt River and go through four traffic lights. STAY IN THE RIGHT-HAND LANE AND FOLLOW SIGNS TO THE BEACHES -- 17 NORTH WILL VEER TO THE RIGHT. As you leave Georgetown you will cross two rivers. After crossing the second bridge (crosses Waccamaw River and AIWW), watch for the entrance to Hobcaw Barony approximately one mile on the right. The Baruch Marine Field Laboratory is located on Hobcaw Barony.

From Ashville, NC:

Take I-26 E (yes – it goes south!) toward HENDERSONVILLE / SPARTANBURG. Cross into SOUTH CAROLINA and continue towards Columbia and then Charleston (212 miles). Take the I-526 exit- EXIT 212B-C- toward SAVANNAH / MT PLEASANT. Merge onto I-526 E via EXIT 212C on the LEFT toward MT PLEASANT (12.2 miles). Take the US-17 N exit- EXIT 29- toward GEORGETOWN (0.7 miles). Turn LEFT onto N US-17 / US-17 N / US-701 N. Continue to follow US-17 N / US-701 N (52.6 miles). Once in Georgetown, you will pass over the Sampitt River and go through four traffic lights. STAY IN THE RIGHT-HAND LANE AND FOLLOW SIGNS TO THE BEACHES -- 17 NORTH WILL VEER TO THE RIGHT. As you leave Georgetown you will cross two rivers. After crossing the second bridge (crosses Waccamaw River and AIWW), watch for the entrance to Hobcaw Barony approximately one mile on the right. The Baruch Marine Field Laboratory is located on Hobcaw Barony.

From Atlanta, GA:

Take I-20 E toward AUGUSTA (Crossing into SOUTH CAROLINA - 204.7 miles). Merge onto US-378 E / SUNSET BLVD via EXIT 61 toward WEST COLUMBIA (2.4 miles). Merge onto I-26 E via the exit on the LEFT. (102.6 miles). Take the I-526 exit- EXIT 212B-C- toward SAVANNAH / MT PLEASANT (193 miles). Merge onto I-526 E via EXIT 212C on the LEFT toward MT PLEASANT (12.2 miles). Take the US-17 N exit- EXIT 29- toward GEORGETOWN (0.7 miles). Turn LEFT onto N US-17 / US-17 N / US-701 N. Continue to follow US-17 N / US-701 N (52.6 miles). Once in Georgetown, you will pass over the Sampitt River and go through four traffic lights. STAY IN THE RIGHT-HAND LANE AND FOLLOW SIGNS TO THE BEACHES -- 17 NORTH WILL VEER TO THE RIGHT. As you leave Georgetown you will cross two rivers. After crossing the second bridge (crosses Waccamaw River and AIWW), watch for the entrance to Hobcaw Barony approximately one mile on the right. The Baruch Marine Field Laboratory is located on Hobcaw Barony.

Emergency Contact Information: Telephone: (843) 546-3623

Weather: The weather in mid-April is usually in the mid 70s but this year the spring has been unusually cool. The station is in the middle of the woods so it is a good idea to bring insect repellent.

Recreational Activities: Georgetown is the 3rd oldest town in South Carolina but it is a small town with limited activities. However, Myrtle Beach is only a few kilometers north and provides plenty of opportunities for enjoyment (see http://www.mbchamber.com).

Restaurants/dining: A daily continental breakfast is provided as part of the lodging fee. Dinner on Wednesday and Thursday as well as lunch on Thursday and Friday is included with the Meeting Registration. There are also a few restaurants and fast-food eateries downtown Georgetown.

Southeastern Society of Parasitologists
2007 Program Summary

Meeting Registration/Check In
Wednesday, 11 April 2007, 3:00 – 5:30 p.m.
Location: Kimbel Center Conference Lodge

SSP Executive Committee
Wednesday, 11 April 2007, 4:00 – 5:00 p.m.
Location: Kimbel Center Conference Lodge – Break room

SSP Presidential Symposium
Wednesday, 11 April 2007, 6:00 – 8:30 p.m.
Location: Kimbel Center Conference Lodge

The Impact of Environmental Change on Parasitism and Disease

Presiding: Claire A. Fuller, Department of Biological Sciences. Murray State University. Murray, KY.

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

6:15 p.m. **I. Dr. Susan Bennett Wilde.** SCDNR Department of Natural Resources and USC Baruch Institute, Charleston, SC.

Avian Vacuolar Myelinopathy; Linking invasive aquatic plants, a novel cyanobacterial species, and an emerging wildlife disease

7:05 p.m. **II. Dr. Gregory Sandland.** Postdoctoral Research Associate, Purdue University, Southbend, IN.

Environmental variation and its impact on parasite and host life histories

7:55 p.m. **III. Dr. Charles Faulkner.** Clinical Parasitologist, University of Tennessee, Knoxville, TN

Human intervention and changing patterns of parasitic infection

SSP Presidental Symposium Speakers Reception and Social
Wednesday Evening, 11 April 2007, 8:45 PM.

Location – Kimbel Center Conference Lodge

PowerPoint Loading Session/Slide Preview. The program used will be MS PowerPoint 2003
Wednesday Evening during Social.
Location - Kimbel Center Conference Lodge – Computer Room

Contributed Papers Session I
Thursday Morning, 12 April 2007, 8:30 a.m. – 12:00 p.m.
Location - Kimbel Center Conference Lodge
*Presenting Author
†Byrd-Dunn Student Paper Competitor

Presiding:
Tiffany Baker, College of Charleston
Heather Stockdale, Auburn University

7:45- 8:15 **Presentation Loading**

8:30 † 4 ***STOCKDALE, HEATHER D.[1], SOREN P. RODNING[2], M. DANIEL GIVENS[1], JENNIFER A. SPENCER[1], CHRISTINE C. DYKSTRA[1], DAVID S. LINDSAY[3], AND BYRON L. BLAGBURN[1].** [1]Auburn University, Department of Pathobiology, College of Veterinary Medicine, Auburn, AL. [2]Auburn University, Department of Animal Sciences, College of Agriculture, Auburn, AL. [3]Virginia Tech, Center for Molecular Medicine & Infectious Disease, V-M Regional College of Veterinary Medicine, Blacksburg, VA. Experimentally induced trichomoniasis in heifers using a feline isolate of *Tritrichomonas foetus.*

8:45 † 5 ***BROWN, EMILY L., AND MICHAEL J. YABSLEY.** Warnell School of Forestry and Natural Resources and the Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, University of Georgia, Athens, GA. Seroprevalence of *Trypanosoma cruzi* in raccoons and opossums from Georgia.

9:00 † 6 ***MITCHELL, SHEILA M., ANNE ZAJAC, AND DAVID S. LINDSAY.** Virginia Tech, Blacksburg, VA. Comparison of extraintestinal stages of *Cystoisospora belli* to monozoic cysts of *Cystoisospora canis* grown in cell culture.

9:15 † 7 ***O'DELL, KATIE, KIRA NEWCOMB, ASHLEY WIMSATT, AND CHRIS HALL.** Department of Biology, Berry College, Mount Berry, GA. Vector considerations in the maintenance of endemic *Trypanosoma cruzi* cycles in Georgia.

9:30 † 8 ***WIMSATT, ASHLEY[1], BRAD MEERS[1], EMILY PIERCE[1], CHRISTOPHER KRIBS-ZALETA[2], AND CHRIS HALL[1].** [1]Department of Biology, Berry College, Mount Berry, GA. [2]Department of Mathematics, University of Texas at Arlington. Arlington, TX. *Trypanosoma cruzi* in the Southeastern United States: A novel epidemiological model to address a potentially unique system.

9:45 † 9 ***SAVAGE, MASON Y. [1], MICHAEL J. YABSLEY [1,2], DANIEL G. MEAD [1], LAUREL E. GARRISON [3], GAYLORD P. LOPEZ[4].** [1]Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, The University of Georgia, Athens, GA. [2]Warnell School of Forestry and Natural Resources, The University of Georgia, Athens, GA. [3]Georgia Division of Public Health, Atlanta, GA. [4]Georgia Poison Center, Atlanta, GA. Detection of tick-borne pathogens in ticks collected off Georgia residents.

10:00 † 10 ***BARAHONA, NATALIA AND CHERYL D. DAVIS.** Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY. Quantum dot immuno-conjugates allow for reliable, photo-stable detection of intracellular stages of *Toxoplasma gondii.*

10:15 **BREAK**

10:30 † 11 ***MCELWAIN, ANDREW, AND GEORGE W. BENZ.** Middle Tennessee State University, Murfreesboro TN. In the Nose of Jaws: Patterns of Infection of the copepod, *Kroeyerina elongata* on Blue Sharks.

10:45 † 12 ***BRYAN, TIMOTHY AND ISAURE DE BURON.** Department of Biology, College of Charleston, Charleston SC. *Oithona colcarva*, a copepod species putative intermediate host for the philometrids *Philometra overstreeti* and *Philometroides paralichthydis.*

11:00 † 13 ***BILLETER, SARAH A.[1], MELISSA MILLER[2], EDWARD B. BREITSCHWERDT[1], AND MICHAEL G. LEVY[1].** [1]Center for Comparative Medicine and Translational Research, North Carolina State University College of Veterinary Medicine, Raleigh, North Carolina; [2]U.S. Army Center for Health Promotion and Preventive Medicine-North, Ft. Meade, Maryland. Detection of potentially novel *Bartonella* species in *Amblyomma americanum* ticks.

11:15 † 14 ***ZHOU, YI, STEVIE CARRARO, AND CHERYL D. DAVIS.** Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY. Antioxidant Supplementation Stimulates Intense Inflammatory Response in Brains of Mice Infected With *Toxoplasma gondii.*

11:30 † 15 ***MURDOCK, JESSICA H.[1,2] MICHAEL J. YABSLEY[1,2], CHANDRASHEKAR RAMASWAMY[3], TOM O'CONNOR[3], AND SUSAN E. LITTLE[4].** 1- University of Georgia, Warnell School of Forestry and Natural Resources, Athens, GA, 2- Southeastern Cooperative Wildlife Disease Study, Athens, GA, 3- IDEXX Laboratories, Westbrook, ME, 4- Oklahoma State University Center for Veterinary Health Sciences, Stillwater, OK. Use of white-tailed deer as

sentinels for *Borrelia* spp. in the eastern United States.

11:45 † 16 ***ROELLIG, DAWN M.[1,2], WENDY FUJITA[2], MASON Y. SAVAGE[2], AND MICHAEL J. YABSLEY[1,2].** [1]Department of Infectious Diseases, College of Veterinary Medicine, The University of Georgia, Athens, GA. [2]Southeastern Cooperative Wildlife Disease, Department of Population Health, College of Veterinary Medicine, The University of Georgia, Wildlife Health Building, Athens, GA. Molecular characterization of US isolates of *Trypanosoma cruzi.*

12:00 – 1:30 p.m. Lunch Break
Location – Kimbel Center Conference Lodge

Contributed Papers Session II
Thursday Afternoon, 12 April 2007, 1:45 p.m. – 3:45 p.m.
Location – Kimbel Center Conference Lodge
*Presenting Author
†Byrd-Dunn Student Paper Competitor

Presiding:
Andrew McElwain, Middle Tennessee State University
Ashley Wimsatt, Berry College

1:15-1:30 **PRESENTATION LOADING**

1:45 † 17 ***GOODWIN, DAVID[1], ANNE M. ZAJAC[1], J.P. DUBEY[2], and DAVID S. LINDSAY[1].** [1]Department of Biomedical Sciences and Pathobiology, Virginia Maryland Regional College of Veterinary Medicine, Blacksburg. VA. [2]*USDA, ARS, ANRI, Animal Parasitic Diseases Laboratory, BARC-East, Beltsville, MD.* Prevalence of antibodies to *Encephalitozoon cuniculi* a Microsporidian parasite in South American dogs.

2:00 † 18 ***PETLURU, VIPULA AND CHERYL D. DAVIS.** Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY. Effect of antioxidant supplementation on the production of nitric oxide and inducible nitric oxide synthase in a murine model of Toxoplasmosis.

2:15 † 19 ***EDENFIELD, CATHERINE[1], BRAD MEERS[1], CAROL RUCKDESCHEL[2], AND CHRIS HALL[1].** [1]Department of Biology, Berry College, Mount Berry, GA. [2]Cumberland Island Museum of Natural History, Cumberland Island, GA. A survey of mammalian species on Cumberland Island, GA for the presence of *Trypanosoma cruzi*.

2:30 † 20 ***GERHOLD, RICHARD W., MICHAEL J. YABSLEY, AND JOHN R. FISCHER.** Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, The University of Georgia, Athens, GA. Molecular characterization of the ITS regions of *Trichomonas gallinae*.

2:45 **BREAK**

3:00 21 ***BAKER, TIFFANY G. AND BROOKE HERRON.** College of Charleston, Biology Department, Charleston, SC. Population dynamics of *Diplectanotrema* sp., a monogenean parasitizing the esophagus of the Atlantic croaker, *Micropogonias undulatus.*

3:15 22 ***ESLICK, RENE M., VINCE A. CONNORS, AND LEANNA LEDFORD.** University of South Carolina Upstate. Superoxide detection in cells from the *Biomphalaria glabrata* embryonic (BGE) cell line.

3:30 23 ***ULICNY, KENNETH[1], D. RANDY STEWART[1], ANDREW MCELWAIN[1], HAROLD L. PRATT, JR.[2] AND GEORGE W. BENZ[1].** [1]Department of Biology, Middle Tennessee State University, Murfreesboro, TN. [2]Center for Shark Research, Mote Marine Laboratory, Summerland Key, FL. Proper sealing of Whirl-Pak® , Twirl'em®, and similar sample bags.

3:45 24 ***PEREZ, GINA R.[1], WILLIAM A. ROUMILLAT[1], ERIN LEVESQUE[1], AND ISAURE DE BURON[2].** [1]South Carolina Department of Natural Resources, Marine Resources Division, Inshore Fisheries Section, Charleston, SC. [2]Department of Biology, College of Charleston, Charleston, SC. Seasonal occurrence and ecology of the nematode *Philometra carolinensis*, an ovarian of spotted sea trout (*Cynoscion nebulosus*) in South Carolina.

4:00 – 5:30 **Enjoy the surroundings**

5:30-6:00 **BOOK SIGNING** by Dr. Larry Roberts. Have your textbooks ready!

6:00 Dinner and other activities, including parasite trivia game and parasite-themed television shows.

Contributed Papers Session III
Friday Morning, 13 April 2007, 8:30 a.m. – 10:15 a.m.
Location – Kimbel Center Conference Lodge
*Presenting Author

Presiding:
David Goodwin, Virginia Maryland Regional College of Veterinary Medicine
Dawn Roellig, University of Georgia

7:45- 8:15 **Presentation Loading**

8:30 25 **CROSS, CHERYL, E. C. RAMSAY, STEPHEN KANIA, ALY CHAPMAN, AND *SHARON PATTON.** University of Tennessee College of Veterinary Medicine, Knoxville, TN. *Echinococcus granulosus* in translocated elk in the Great Smoky Mountains National Park (GSMNP).

8:45 26 ***YABSLEY, MICHAEL J.[1,2] ULRIKE G. MUNDERLOH[3], STACI M. MURPHY[2], M. PAGE LUTTRELL[2], AND ELIZABETH W. HOWERTH[4].** [1]D.B. Warnell School of Forestry and Natural Resources, University of Georgia, Athens GA. [2]Southeastern Cooperative Wildlife Disease Study, Department of Population Health, College of Veterinary Medicine, University of Georgia, Athens GA. [3]University of Minnesota, Department of Entomology, St. Paul, MN. [4]Department of Pathology, College of Veterinary Medicine, University of Georgia, Athens GA. Isolation and partial characterization of a novel *Ehrlichia*-like species from raccoons (*Procyon lotor*).

9:00 27 ***PUNG, OSCAR J.[1], CHRISTINA E. JARROUS[1], MICAH H. LANCASTER, AND EDWARD D. BROWN[2].** [1]Department of Biology, Georgia Southern University, Statesboro, GA and [2]Department of Biology, University of Southern Mississippi, Hattiesburg, MS. Effect of temperature and culture medium on the in vitro reproduction and survival of *Microphallus turgidus* (Trematoda: Microphallidae).

9:15 28 ***SPENCER, JENNIFER A., CALVIN M. JOHNSON, MICHAEL TILLSON, SHARRON BARNEY, SARAH MAJOR, RAY DILLON, AND BYRON L. BLAGBURN.** College Of Veterinary Medicine, Auburn University, Auburn, AL. Imunopathogenesis of feline heartworm infection.

9:30 29 ***LINDSAY, DAVID S.[1], DAVE GOODWIN[1], SHEILA M. MITCHELL[1] AND JEANNINE STROBL[2].** [1]Department of Biomedical Science and Pathology, Virginia Tech, Blacksburg, VA; [2]Dept of Biomed Sciences, Edward Via Virginia College of Osteopathic Medicine, Blacksburg, VA. Evaluation of the mood stabilizing agent valproic acid as a preventative for toxoplasmosis in mice.

9:45 30 ***DEREK A. ZELMER.** Department of Biology and Geology, University of South Carolina Aiken, Aiken, SC. Host biology as a community process: parasites of *Lepomis gulosus* in Par pond, South Carolina.

10:00 31 ***ROSYPAL, ALEXA C.[1], RICHARD R. TIDWELL[1], AND DAVID S. LINDSAY[2]**. [1]Department of Pathology and Laboratory Medicine, School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC. [2]Department of Biomedical Sciences and Pathobiology, Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech, Blacksburg, VA. Seroprevalence of *Leishmania infantum* and *Trypanosoma cruzi* in wild canine populations in South Carolina.

SSP Business Meeting
Friday Morning, 13 April 2007, 10:30 a.m.
Location – Kimbel Center Conference Lodge

PROGRAM ABSTRACTS

1. WILDE, SUSAN B[1,2]., SARAH K. WILLIAMS[1], REBECCA HAYNIE[1,3], CHARLOTTE HOPE[1], TOM MURPHY[1], FAITH WILEY[3,4], BILL BOWERMAN[3], AND FRAN VAN DOLAH[4]. [1]South Carolina Department of Natural Resources, Charleston, SC; [2]University of South Carolina, Baruch Institute, Charleston, SC; [3]Clemson University, Clemson, SC; [4]NOAA/National Ocean Service, Charleston, SC. Avian Vacuolar Myelinopathy; Linking invasive aquatic plants, a novel cyanobacterial species, and an emerging wildlife disease.

Our field surveys and feeding studies implicate a novel epiphytic cyanobacteria species and invasive aquatic plants in an emerging avian disease effecting herbivorous waterfowl and their avian predators. Avian Vacuolar Myelinopathy (AVM) is diagnosed by the presence of lesions in the myelin sheath and has been fatal for over 100 American bald eagles (*Haliaeetus leucocephalus*) and 1000's of American coots (*Fulica americana*) and other waterfowl. Reservoirs where bird deaths were most prevalent were dominated by non-native aquatic plants (primarily *Hydrilla verticillata*) and a novel Stigonematales species (covering from 70-95% of the leaf surfaces). In reservoirs where bird deaths from AVM have not been diagnosed, epiphytic assemblages were diverse and abundant, but the suspect Stigonematales species was either rare or not present. Mallard ducks and grass carp fed hydrilla dominated by the novel Stigonematalean species developed AVM lesions in laboratory and field trials. The invasive potential of these exotic plants and their association with the novel cyanobacteria makes it likely that AVM will expand to new sites and the impact of this disease on waterfowl and eagles will continue to increase.

2. SANDLAND, GEGORY J. Purdue University, Southbend, IN. Environmental variation and its impact on parasite and host life histories.

Interactions between hosts and parasites are often assessed using either field-based surveys or one-dimensional laboratory experiments that are performed under constant conditions. The use of these methodologies independently can limit our ability to link natural patterns in host and parasite populations to the processes underlying these patterns. Over the last decade, I have attempted to address this shortcoming by studying a number of host-parasite systems using field collections in combination with multifactorial laboratory experiments that incorporate environmentally relevant variables. Results have demonstrated that the direction and magnitude of host life history expression can be context-dependent, varying with both parasite exposure and other biotic and/or abiotic stressors. Additionally, parasite fitness traits such as development time and reproductive output can be modulated based on the prevailing environmental conditions. The ecological and evolutionary consequences of these patterns for both host and parasite populations will be discussed.

3. FAULKNER, CHARLES T. University of Tennessee College of Veterinary Medicine, Knoxville TN. Human intervention and changing patterns of parasitic infection.

The global distribution of parasitic infections in human and animal populations is determined by the interaction of multiple a biotic and biotic factors. Human intervention, as it is mediated by cultural behavior, provides a dynamic context in which the distribution of parasitic infections and their host populations has varied temporally and spatially. Parasitic infections of early human hunter-gatherer groups most likely involved species that were immediately infective upon passage from the host or were acquired as a result of predator-prey relationships. A trend toward sedentism and intensification of human-animal relationships provided transmission opportunities for parasite species that required long incubation periods in the environment and were perhaps initially shared between these different host populations. Landscape modification activities such as forest clearing and reservoir development associated with human reliance on agriculture have also played an important role in facilitating the spread of parasitic diseases like malaria and schistosomiasis. However, in other cases, community-wide distributions of parasitic infections have been significantly impacted through a combination of hygiene based programs that emphasize reduction of fecal contamination and chemotherapeutic interventions that effectively reduce transmission of parasite stages between infected and susceptible hosts. While the outright eradication of parasitic diseases affecting humanity may not be a realistic goal, successful mitigation of their adverse impact is possible with an appreciation of the dynamic role human intervention often plays in the maintenance of host-parasite relationships.

4. STOCKDALE, HEATHER D.[1], SOREN P. RODNING[2], M. DANIEL GIVENS[1], JENNIFER A. SPENCER[1], CHRISTINE C. DYKSTRA[1], DAVID S. LINDSAY[3], AND BYRON L. BLAGBURN[1]. [1]Auburn University, Department of Pathobiology, College of Veterinary Medicine, Auburn, AL. [2]Auburn University, Department of Animal Sciences, College of Agriculture, Auburn, AL. [3]Virginia Tech, Center for Molecular Medicine & Infectious Disease, V-M Regional College of Veterinary Medicine, Blacksburg, VA. Experimentally induced trichomoniasis in heifers using a feline isolate of *Tritrichomonas foetus*.

Tritrichomonas foetus is most commonly known as the causative agent of bovine trichomoniasis, a sexually transmitted disease in cattle. This disease can be devastating for cattle producers, resulting in large profit loss due to infertility and abortion in infected cows. Over the past 10 years, numerous reports have also linked *T. foetus* to large-bowel diarrhea in cats. Morphological description of the organism and genomic sequencing data of an internal transcribed spacer (ITS) region and 5.8SrRNA gene support the hypothesis that *T. foetus* is the causative agent of both bovine trichomoniasis and large-bowel diarrhea in cats. However, host specificity is another aspect of determining whether or not one organism can thrive in two very different environments, causing two different diseases. In order to answer this question, two groups of 10 virgin heifers were obtained and experimentally infected with *T. foetus.* The first group was inoculated with a bovine isolate of *T. foetus* collected from a naturally infected cow and served as a control. The second group was inoculated with a feline isolate of *T. foetus* obtained from the feces of a naturally infected cat. Over the course of 11 weeks, serial vaginal, cervical and uterine mucus samples were obtained, along with single transcervical uterine biopsy samples, to determine disease infection patterns for both isolates. Our results indicate that the disease induced by the feline isolate of *T. foetus* was comparable to disease induced by the bovine isolate of *T. foetus.*

5. BROWN, EMILY L., AND MICHAEL J. YABSLEY. Warnell School of Forestry and Natural Resources and the Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, University of Georgia, Athens, GA. Seroprevalence of *Trypanosoma cruzi* in raccoons and opossums from Georgia.

Trypanosoma cruzi, the causative agent of American trypanosomiasis (Chagas' disease) is a substantial public health problem in Latin America. In the US, several species of wildlife are the primary hosts, although some domestic animal and human cases have been reported. A wide range of mammals are naturally infected with *T. cruzi*, but the two primary reservoirs in the US are believed to be raccoons (*Procyon lotor*) and opossums (*Didelphis virginiana*). Raccoon and opossum serum samples from Georgia were tested for anti-*T. cruzi* antibodies using the indirect immunoflourescent antibody test. Fourteen of 40 (35%) raccoons and 15 of 45 (33%) opossums were seropositive for *T. cruzi* at a 1:40 titer cutoff. The similar prevalence suggests that the exposure level of raccoons and opossums is similar. However, these data are in contrast to previous studies based on culture, which indicated that the *T. cruzi* prevalence was lower in opossums compared with raccoons. This is the first study to investigate the seroprevalence of *T. cruzi* in Virginia opossums. Once complete, this study will bring insight into the seroprevance in these and additional hosts from multiple states in the US, potential temporal changes in seroprevalence, and differences in seroprevalence between urban and rural mammal populations.

6. MITCHELL, SHEILA M., ANNE ZAJAC, AND DAVID S. LINDSAY. Virginia Tech, Blacksburg, VA. Comparison of extraintestinal stages of *Cystoisospora belli* to monozoic cysts of *Cystoisospora canis* grown in cell culture.

Cystoisospora belli (*syn Isospora belli*) is a cocidial parasite that causes serious disease in humans, especially immunocompromised patients. Clinical symptoms are similar to those that cause canine coccidiosis, such as watery diarrhea, vomiting, fever and weight loss. *Cystoisospora canis* is a coccidian parasite of the intestinal tract that can cause severe disease in canines. Extraintestinal stages of both these parasites have been demonstrated in the lymph nodes of humans with *C. belli* and in the mesenteric lymph nodes of canines and paratenic hosts with *C. canis*. Information is limited on the biology of extraintestinal stages of canine *Cystoisospora* species. Recent attempts to grow *C. canis* in cell culture demonstrated only monozoic cyst-like structures. The present study compares light microscopy (LM) photographs and transmission electron microscopy photographs (TEM) of extraintestinal tissue cysts of *C. belli* and *C. canis* monozoic cyst grown in cell culture. Light microscopy of *C. belli* and *C. canis* show a single centrally located zoite with in a thick walled tissue cyst. No multinucleated stages of *C. canis* grown in cell culture were observed on either LM or TEM photographs. A crystalloid body was seen in both species of coccidian zoites on TEM photographs. Parasitophorous vacuoles of *C. canis* cysts had a larger electron-lucent space and larger granular wall material the longer they were allowed to grow in cell culture. This is the first study to look at TEM of *C. canis* in cell culture.

7. O'DELL, KATIE, KIRA NEWCOMB, ASHLEY WIMSATT, AND CHRIS HALL. Department of Biology, Berry College, Mount Berry, GA. Vector considerations in the maintenance of endemic *Trypanosoma cruzi* cycles in Georgia.

Vector transmission of *Trypanosoma cruzi* in the southeastern United States is mediated primarily by *Triatoma sanguisuga*. Despite the high *T. cruzi* prevalence measured in several reservoir species, the precise role of *T. sanguisuga* has been called into question. To determine whether high prevalence in reservoir species correlated to vector density we conducted extensive surveys of a peri-domestic area known to support a high prevalence of *T. cruzi* infection in the raccoon population. No evidence for *Triatomine* presence could be found. Additional searches of chicken houses in the region also failed to find any direct evidence for vector presence. Additional information was obtained during serological testing of the free-ranging lemurs on St. Catherines Island. Although 50% of the animals tested were seropositive for *T. cruzi*, only five *T. sanguisuga* specimens could be found during a day-long survey. Analysis of the lemur breeding records from St. Catherines showed that infection was positively correlated to an animal being born on the island but not with the length of time actually spent on the island. Collectively these results suggest that vectors may not represent the dominant means of transmitting *T. cruzi* infection.

8. WIMSATT, ASHLEY[1], BRAD MEERS[1], EMILY PIERCE[1], CHRISTOPHER KRIBS-ZALETA[2], AND CHRIS HALL[1]. [1]Department of Biology, Berry College, Mount Berry, GA. [2]Department of Mathematics, University of Texas at Arlington. Arlington, TX. *Trypanosoma cruzi* in the Southeastern United States: A novel epidemiological model to address a potentially unique system.

Although *Trypanosoma cruzi* is broadly distributed throughout the southeastern United States little is known of the epidemiological factors that contribute to the high prevalence found in some sylvatic reservoir host species. Previous work has demonstrated a particularly high prevalence (≥ 50%) in some populations of raccoons (*Procyon lotor*). Based upon available data and accepted mathematical modeling techniques such a high prevalence cannot be supported simply through vector transmission. This coupled with the theories of virulence management suggests a significant reliance upon an alternative and parallel mode of transmission. Consistent with this hypothesis, and a proposed evolutionary tie to placental mammals, we found that vertical transmission of a regional Type IIa strain occurred at twice the rate as with the Type I Brazil strain. We propose a novel mathematical model that incorporates the contributions of both vector mediated and vertical transmission. This model supports the hypothesis that a coupling of horizontal and vertical transmission is essential in maintaining the endemic sylvatic cycle of *Trypanosoma cruzi* in the southeastern United States.

9. SAVAGE, MASON Y. [1], MICHAEL J. YABSLEY [1,2], DANIEL G. MEAD [1], LAUREL E. GARRISON [3], GAYLORD P. LOPEZ[4]. [1]Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, The University of Georgia, Athens, GA. [2]Warnell School of Forestry and Natural Resources, The University of Georgia, Athens, GA. [3]Georgia Division of Public Health, Atlanta, GA. [4]Georgia Poison Center, Atlanta, GA. Detection of tick-borne pathogens in ticks collected off Georgia residents.

There are at least seven tick-borne diseases endemic in Georgia. Infected individuals typically present with non-specific flu-like symptoms, though symptoms may range from asymptomatic to death. To determine the prevalence of tick-borne pathogens in ticks attached to Georgia residents, citizens could submit ticks to the Georgia Poison Control or Department of Human Resources for testing. Ticks were sent to UGA where they were identified to species and tested by polymerase chain reaction (PCR) for several pathogens including *Ehrlichia chaffeensis*, *Ehrlichia ewingii*, *Anaplasma phagocytophilum*, *Rickettsia* spp., *Borrelia* spp., and *Francisella tularensis*. All PCR positive samples were sequence confirmed. From April 2005 to December 2006, 446 residents submitted a total of 597 ticks. *Amblyomma americanum* was the most commonly submitted tick (n=417) followed by *Dermacentor variabilis* (142), *A. maculatum* (18), and *Ixodes scapularis* (7). The remaining samples were either not a tick (i.e., hippoboscid) or were unidentifiable. To date, 99 of 340 (29.1%) *A. americanum* were positive for *Rickettsia amblyommii*, and 1 each (0.3%) for *R. rickettsii* Mexico strain, *E. chaffeensis*, and *B. lonestari*. Of the 120 *D. variabilis* tested, 19 (15.8%) were positive for *Rickettsia montanenesis* and 2 (1.7%) were positive for *Ehrlichia ewingii*. Four of 16 (25%) *A. maculatum* and 6 of 7 (85.7%) *I. scapularis* were positive for *Rickettsia* spp. The *Rickettsia* spp. identified in the ticks are considered symbionts and have not been associated with human disease. The results of this study indicate that the citizens of Georgia are potentially exposed to several tick-borne pathogens.

10. BARAHONA, NATALIA AND CHERYL D. DAVIS. Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY. Quantum dot immuno-conjugates allow for reliable, photo-stable detection of intracellular stages of *Toxoplasma gondii.*

Luminescent quantum dot nanoparticles have emerged as a highly effective alternative to organic fluorescence probes in a variety of applications employing the use of immunoconjugates. In the present study, we have successfully used quantum dot technology for the immunofluorescent detection of intracellular stages of *Toxoplasma gondii* in a CV-1 mammalian cell line. A Lab-Tek cell culture system was used to determine optimal concentrations of primary and secondary antibodies. Infected CV-1 monolayers were fixed in 4% formalin and cell membranes were permeabilized with detergent prior to blocking and immunolabeling. The use of a mouse anti-*T. gondii* primary antiserum followed by quantum dot – conjugated secondary antibody (Goat anti-mouse IgG) resulted in a punctate, intensely bright fluorescent labeling of intracellular tachyzoite stages with no evidence of photobleaching or fading. In addition, the application of coverslips using Cryoseal Mounting Media 60, allowed for the long term storage of stained slide preparations. The support of NIH Grant Number 2 P20 RR-16481 from the National Center for Research Resources is gratefully acknowledged.

11. MCELWAIN, ANDREW, AND GEORGE W. BENZ. Middle Tennessee State University, Murfreesboro TN. In the Nose of Jaws: Patterns of Infection of the copepod, *Kroeyerina elongata* on Blue Sharks.

Elasmobranch olfactory sacs are comprised of a series filaments and lamellae which create a series of small, heterogeneously structured habitats where some parasites live. Although no

detailed published studies exist on the distribution of copepods in the olfactory sacs of fishes, casual observations suggest that some copepods infect specific places within the olfactory sacs of sharks. Building on results of a pilot study, we investigated the infection patterns of 3,118 *K. elongata* in the olfactory sacs of 20 blue sharks. The number of copepods per olfactory sac ranged from 0 to 213 (mean = 82.7 ± 10.07; n = 40) with females typically outnumbering males. Within the olfactory sacs, about 83% of all copepods faced upstream relative to the flow of water through the olfactory sac. There was no linear relationship between shark fork length and copepod intensity ($r^2 = 0.114$, P = 0.275) and no significant difference was discovered between copepod intensity in left vs. right olfactory sacs (t = 0.002, P = 0.998). Adult female copepods typically occupied the central chambers of the olfactory sac while adult males typically infected distal chambers nearest the nares. Within olfactory sac chambers, females were usually found attached to the base of the rachis or within the first third of the excurrent water channel while males were usually attached to or between olfactory lamellae. When considered with respect to the pattern of water flow through the olfactory sac, these results can be used to propose a lifecycle for *K. elongata*.

12. BRYAN, TIMOTHY AND ISAURE DE BURON. Department of Biology, College of Charleston, Charleston SC. *Oithona colcarva*, a copepod species putative intermediate host for the philometrids *Philometra overstreeti* and *Philometroides paralichthydis*.

Philometra overstreeti and *Philometroides paralichthydis* are philometrids commonly found infecting the buccal cavity of southern flounder, *Paralichthys lethostigma*, in the South Carolina estuarine system. Gravid females of *P. overstreeti* are located among the teeth on the upper and lower jaw, whereas gravid females of *P. paralichthydis* are associated with various bones of the buccal cavity. Copepods belonging to five species common to the Charleston Harbor, *Acartia tonsa, Parvocalanus crassirostris, Saphirella tropica, Temora turbinata,* and *Oithona colcarva*, were collected and exposed to first stage larvae of both species of philometrid. *O. colcarva* was the only copepod species that successfully allowed the development of larvae of both *P. overstreeti* and *P. paralichthydis* in the hemocoel. For both species of philometrids, the first molt, from L1 to L2, was observed as early as 24 hours post exposure. Indications of a second molt from L2 to L3 occurring 5 days post exposure were noted but were not conspicuous and needed better resolution microscopy. A study verifying second molting using semi-thin serial sections of infected copepods as well as transmission electron microscopy was initiated and results will be presented. Funded in part by a Summer Undergraduate Research with Faculty grant from the College of Charleston.

13. BILLETER, SARAH A.[1], MELISSA MILLER[2], EDWARD B. BREITSCHWERDT[1], AND MICHAEL G. LEVY[1]. [1]Center for Comparative Medicine and Translational Research, North Carolina State University College of Veterinary Medicine, Raleigh, North Carolina; [2]U.S. Army Center for Health Promotion and Preventive Medicine-North, Ft. Meade, Maryland. Detection of potentially novel *Bartonella* species in *Amblyomma americanum* ticks.

Bartonella species are gram-negative bacteria that infect erythrocytes, endothelial cells and macrophages, often leading to persistent blood-borne infections. Due to the ability of various

Bartonella species to reside within erythrocytes of a diverse number of animal hosts, there is substantial opportunity for the uptake of these blood-borne bacteria by a variety of hematophagous arthropods that feed on animals and people. Various investigators have reported *Bartonella* in *Ixodes*, *Dermacentor*, and *Rhipicephalus* ticks throughout the United States; however, none have demonstrated *Bartonella* DNA in *Amblyomma americanum*, the lone star tick. Four hundred and sixty-six questing *A. americanum* ticks from Carolina County, Virginia were screened by polymerase chain reaction (PCR) for the 16S-23S ITS spacer region of *Bartonella*. A potentially novel *Bartonella* species was detected in two ticks (prevalence 0.42%). A questing adult male and female tick harbored a *Bartonella* species closely related to *B. tamii* based upon PCR and sequencing. Investigations into potential transmission of *Bartonella* spp. by *A. americanum* ticks should be the focus of future experimental studies.

14. ZHOU, YI, STEVIE CARRARO, AND CHERYL D. DAVIS. Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY. Antioxidant Supplementation Stimulates Intense Inflammatory Response in Brains of Mice Infected With *Toxoplasma gondii*.

Previous studies have shown that dietary supplementation with antioxidants is harmful during murine infection with the protozoan parasite, *Toxoplasma gondii*. In both Swiss Webster and C57BL/6 mice, supplementation with vitamin E and selenium resulted in increased tissue cyst number, tissue pathology, and weight loss during *T. gondii* infection. The goal of the present study was to determine the impact of antioxidant supplementation on gene expression in the brains of infected and non-infected mice. Whole genome screening of RNA isolated from the brains of C57Bl/6 mice was performed using Agilent Oligo Microarrays. Comparison of the transcripts in non-infected and infected brain tissue revealed 1,688 differentially expressed genes ($p < 0.05$), of which 507 genes were up regulated (2-fold or greater) and 71 genes were down regulated (2-fold or greater) in infected mice. The gene showing the greatest increase in expression was interferon inducible GTPase 1, with a 160-fold increase ($p = .028$). Similarly, interferon gamma induced GTPase showed a 119-fold increase ($p = .035$) in expression in infected mice. Nineteen chemokine or chemokine receptor genes, and over 60 cytokine or cytokine-related genes also showed increased expression. The results of this study demonstrate that the increased pathology observed in mice maintained on an antioxidant-supplemented diet is correlated with an intense pro-inflammatory response. Greater than 70% of all genes up-regulated in the brains of infected mice could be categorized as pro-inflammatory, immune function, or cellular defense genes. Support of the National Institutes of Health and the National Center for Research Resources Grant P20 RR16481 is gratefully acknowledged.

15. MURDOCK, JESSICA H.[1,2] MICHAEL J. YABSLEY[1,2], CHANDRASHEKAR RAMASWAMY[3], TOM O'CONNOR[3], AND SUSAN E. LITTLE[4]. 1- University of Georgia, Warnell School of Forestry and Natural Resources, Athens, GA, 2- Southeastern Cooperative Wildlife Disease Study, Athens, GA, 3- IDEXX Laboratories, Westbrook, ME, 4- Oklahoma State University Center for Veterinary Health Sciences, Stillwater, OK. Use of white-tailed deer as sentinels for *Borrelia* spp. in the eastern United States.

In the United States, Lyme disease, caused by the spirochete *Borrelia burgdorferi*, is most common in the northern and western United States and is vectored by the blacklegged tick (*Ixodes scapularis* and *Ixodes pacificus*). Lyme disease causes an erythema migrans rash, fever, fatigue, and headache and can cause chronic sequelae (e.g., heart palpitations, arthritis, etc). In the southern United States, a Lyme-like disease has been reported which may be caused by *B. lonestari*, a spirochete that is transmitted by the lone star tick (*Amblyomma americanum*) and naturally infects white-tailed deer (*Odocoileus virginianus*). The object of this project was to determine the usefulness of deer as sentinels for these *Borrelia* spp. To date, 447 white-tailed deer from 19 states were tested for anti-*Borrelia* spp. antibodies using a *B. lonestari* whole-cell antigen indirect immunofluorescent antibody test (IFAT). By IFAT, 97 (21.7%) were positive for anti-*Borrelia* antibodies at a 1:64 dilution. To determine the prevalence of *B. burgdorferi*, samples were tested using a highly specific IDEXX 4Dx SNAP test. By SNAP, 33 (7.4%) were positive. Seventeen deer were positive by both assays, but 16 *B. burgdorferi*-positive deer were IFAT negative suggesting that IFAT testing alone is not sufficient to detect *B. burgdorferi* exposure. The majority of *B. burgdorferi*-positive deer were from northern-tier states, which corresponds with the risk of human Lyme disease. These data indicate that deer are exposed to *Borrelia* spp. and could be used as sentinels. Future work will be conducted to test additional samples and to develop a *B. lonestari*-specific assay.

16. ROELLIG, DAWN M.[1,2], WENDY FUJITA[2], MASON Y. SAVAGE[2], AND MICHAEL J. YABSLEY[1,2]. [1]Department of Infectious Diseases, College of Veterinary Medicine, The University of Georgia, Athens, GA. [2]Southeastern Cooperative Wildlife Disease, Department of Population Health, College of Veterinary Medicine, The University of Georgia, Wildlife Health Building, Athens, GA. Molecular characterization of US isolates of *Trypanosoma cruzi.*

Trypanosoma cruzi, the causative agent of Chagas disease, has a broad host and geographic range, leading to many questions concerning its epizootiology. In particular, it is imperative to understand the association between the genetic type of the parasite, virulence, and primary reservoir hosts. While molecular characterization of South American isolates of *T. cruzi* has demonstrated homologous recombination and nuclear hybridization, as well as the presence of two phylogenetic lineages (Type I and II), few studies have extensively investigated such exchange events and genetic diversity in North American isolates. In the current study, we genetically characterized US isolates from wildlife reservoirs (raccoons, opossums, armadillos), dogs, humans, nonhuman primates, and reduviid vectors. To determine genotype, the mismatch repair (MSH2) and glutathione-s-transferase (TC52) genes were amplified and sequenced from parasite cultures. To investigate genetic exchange, nuclear and mitochondrial gene targets, dihydrofolate reductase-thymidylate synthase and the NADH dehydrogenase subunit I-cytochrome oxidase subunit II region, respectively, were amplified and sequenced. Sequences were compared to each other and strains available in GenBank. Initial sequence typing of MSH2 and TC52 genes from selected Florida and Georgia opossum, raccoon, armadillo, and vector isolates showed single nucleotide polymorphisms and support for the existence of the two primary genotypes. Upon further investigation of ecologically and geographically distinct *T. cruzi* isolates, we hypothesize that additional genetic variability between N. and S. American isolates will be observed. Further, based on previous evidence of a single genetic exchange

event in a Florida isolate, we expect to observe genetic exchange in additional US isolates as demonstrated by incongruent mitochondrial and nuclear genes phylogenies.

17. GOODWIN, DAVID[1], ANNE M. ZAJAC[1], J.P. DUBEY[2], and DAVID S. LINDSAY[1]. [1]Department of Biomedical Sciences and Pathobiology, Virginia Maryland Regional Collage of Veterinary Medicine, Blacksburg. VA. [2]*USDA, ARS, ANRI, Animal Parasitic Diseases Laboratory, BARC-East, Beltsville, MD.* Prevalence of antibodies to *Encephalitozoon cuniculi* a Microsporidian parasite in South American dogs.

Microsporidia are obligate intracellular spore-forming parasites, shown to infect an extensive array of mammals, including humans. Dog populations previously screened for antibodies to *Encephalitozoon cuniculi* have demonstrated prevalence ranging from 37%-0% depending on the geographic location. *E. cuniculi* type III, a dog strain, previously isolated from a human suggests zoonotic capabilities of the parasite. Typically *E. cuniculi* infections in immunocompetent human hosts are asymptomatic, but are potentially clinically important in immunocompromised patients. Dogs and humans maintain a close relationship, existing for over 10 thousand years with a constant threat of zoonotic transmission of disease. Upon examination of 254 dog serum samples from Columbia and 111 dog serum samples from Brazil, the prevalence of dogs presenting with antibodies to *E. cuniculi* was 14.1% and 15.3%, respectively. The antibody tests used are direct agglutination and immunofluorescent antibody assay. The direct agglutination test has a sensitivity of 85% and a specificity of 94% when compared to immunofluorescent assay the "Gold Standard" for serological testing. The results of our study indicate the dogs screened have encountered *E. cuniculi* and posses the capability of transmitting the parasite to humans through close proximity.

18. PETLURU, VIPULA AND CHERYL D. DAVIS. Department of Biology, Biotechnology Center, Western Kentucky University, Bowling Green, KY. Effect of antioxidant supplementation on the production of nitric oxide and inducible nitric oxide synthase in a murine model of Toxoplasmosis.

Previous studies in our laboratory have shown that dietary supplementation with vitamin E and selenium during murine infection with *Toxoplasma gondii* results in increased tissue cyst number, tissue pathology, and weight loss in both resistant and susceptible mouse strains. Real-time reverse transcriptase PCR (Real-time RT-PCR) and microarray analysis of gene expression has also revealed an intense inflammatory response in the brains of infected mice supplemented with antioxidants. The production of nitric oxide during acute infection with *T. gondii* has been shown to have a potent microbicidal effect on intracellular stages of the parasite, however, high levels can be detrimental, and even lethal to the host. The purpose of the present study was to investigate the impact of antioxidant supplementation on the production of nitric oxide and inducible nitric oxide synthase (iNOS) in this murine model of *T. gondii* infection. Total nitric oxide present in mouse sera was quantified using a colorimetric assay kit. iNOS gene expression in mouse brains was quantified using microarray analysis and confirmed by Real-time RT-PCR. Spleen samples from mice will also be analyzed for iNOS expression by Real-time RT-PCR. Preliminary results indicate that both NO and iNOS levels are enhanced in antioxidant supplemented mice maintained on a diet containing elevated levels of vitamin E and selenium as

compared to mice maintained on an antioxidant deficient diet. The support of NIH Grant Number 2 P20 RR-16481 from the National Center for Research Resources is gratefully acknowledged.

19. EDENFIELD, CATHERINE[1], BRAD MEERS[1], CAROL RUCKDESCHEL[2], AND CHRIS HALL[1]. [1]Department of Biology, Berry College, Mount Berry, GA. [2]Cumberland Island Museum of Natural History, Cumberland Island, GA. A survey of mammalian species on Cumberland Island, GA for the presence of *Trypanosoma cruzi*.

Trypanosoma cruzi is endemic along the barrier island complex of Georgia with many mammalian species potentially serving as reservoir hosts. Cumberland Island, the southern most island in the complex, is designated as a National Seashore, drawing over 10,000 hikers and campers each year. With the cooperation of the Cumberland Island Museum of Natural History we have begun testing the tissues of various mammalian species captured on the island, and some adjoining areas, using *T. cruzi* specific PCR. Thus far the results include 27 tissues samples collected from 9 different species. The overall prevalence of *T. cruzi* in the samples tested is 70%. Interestingly all three species of bats tested (*Eptesicus fuscus (3/4), Lasuzms Semmolus (1/1),* and *Tadarida brasiliensis (1/1)*) gave positive PCR results for trypanosome infection. One (1/1) Deer Mouse (*Peromyscus maniculatus*), one feral hog (1/1) and three (3/5) *Scalopus spp*. also tested positive. This indicates that *T. cruzi* is endemic on Cumberland Island with a broad species diversity of reservoir hosts.

20. GERHOLD, RICHARD W., MICHAEL J. YABSLEY, AND JOHN R. FISCHER. Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, The University of Georgia, Athens, GA. Molecular characterization of the ITS regions of *Trichomonas gallinae*.

Avian trichomonosis, caused by *Trichomonas gallinae,* is reported from most continents and is considered the most important disease in mourning doves (*Zenaida macroura*). Additionally, trichomonosis has caused significant mortality events in raptors and other bird species. Clinically virulent and avirulent *T. gallinae* isolates were collected from free-ranging mourning dove (n=10), rock pigeon (*Columba livia*) (n=40), white-winged dove (*Zenaida asiatica*) (n=4), band-tailed pigeon (*Columba fasciata*) (n=3), Eurasian collared-dove (*Streptopelia risoria*) (n=1), common ground-dove (*Columbina passerina*) (n=1), broad-winged hawk (*Buteo platypterus*) (n=1), house finch (*Carpodacus cassinii*) (n=1), and Cooper's hawk (*Accipiter cooperii*) (n=3) from a widespread geographical range within the United States (AZ, CA, CO, FL, GA, KY, MA, PA, and TX). The isolates were cultured in Diamond's media (pH 7.0) supplemented with 10% horse serum. DNA was extracted from axenic cultures using Qiagen® DNA mini-kit per the manufacture's instructions. The ITS1, 5.8S rRNA, and ITS2 regions were amplified by PCR using the primers TFR1 and TFR2. Genetic sequences of the amplicons were compared to each other as well as other trichomonad sequences in GenBank using Sequencher. The results of the sequence analysis suggest that there are at least two different species within the *T. gallinae* morphologic complex. One group is closely related to the two *T. gallinae* sequences available in GenBank (both from rock pigeons) while the other group of our isolates is more closely related to *T. vaginalis* (99 %) than to *T. gallinae* (92%).

21. BAKER, TIFFANY G. AND BROOKE HERRON. College of Charleston, Biology Department, Charleston, SC. Population dynamics of *Diplectanotrema* sp., a monogenean parasitizing the esophagus of the Atlantic croaker, *Micropogonias undulatus*.

The ancyrocephalid monogenean *Diplectanotrema* sp. was found in the esophagus of the Atlantic croaker, *Micropogonias undulatus* in the Northwestern Atlantic Ocean. Fish were collected offshore from New Jersey to Florida during the fall and spring seasons from 2002 to 2004. The geographic range of *Diplectanotrema* sp. within the study area was found to be restricted to the South Atlantic Bight, stretching from Cape Hatteras, NC, to Cape Canaveral, FL. The population dynamics of this monogenenan was studied within that area and additional samples were made during the summer of 2004. The fish analyzed ranged from 0-5 years old. Overall prevalence was 11.2% and mean intensity was 7.3 ± 2.1 worms (N= 366). Effects of various biotic (host age, sex, and standard length) and abiotic (season, water temperature, and salinity) variables on prevalence and intensity of *Diplectanotrema* sp. were analyzed and tested using the G-test and Kruskal-Wallis test, respectively. Preliminary results showed a significant effect of season, water temperature, host age, and host sex on the prevalence of the monogenean. The monogenean was found only during the summer and fall seasons, with the highest prevalence in the summer (24%). Fish two years of age and older were not infected by the monogenean, and young-of-the-year (age 0) exhibited the greatest prevalence of infection (14.5%). Female fish were more often infected by *Diplectanotrema* sp. than male fish (11.8% and 2.1%, respectively). There was no significant effect of any of the variables examined on the intensity of the monogenean which showed a typical negative binomial distribution. Funded in part by NMFS/NOAA grant #NA17FF2885.

22. ESLICK, RENE M., V. A. CONNORS, and L. LEDFORD. University of South Carolina Upstate. Superoxide detection in cells from the *Biomphalaria glabrata* embryonic (BGE) cell line.

Early work reported from our laboratory demonstrated low level production of the reactive oxygen species, superoxide, in phagocytically active *Biomphalaria glabrata* embryonic (BGE) cell in an osmotically balanced salt solution. However, the cells that produced superoxide did not appear to be in good health, possibly as the result of culture in the balanced salt solution, The purpose of this work was to determine if culture in BGE cell culture media increased the ability to detect superoxide production in the cells. Results indicate a significant increase in both phagocytosis and the detection of superoxide using NBT reduction to formazan as an indicator in the presence of normal media. These results indicate BGE cells may yet be useful as an i*n vitro* model of the schistosome-snail interaction.

23. ULICNY, KENNETH[1], D. RANDY STEWART[1], ANDREW MCELWAIN[1], HAROLD L. PRATT, JR.[2] AND GEORGE W. BENZ[1]. [1]Department of Biology, Middle Tennessee State University, Murfreesboro, TN. [2]Center for Shark Research, Mote Marine Laboratory, Summerland Key, FL. Proper sealing of Whirl-Pak® , Twirl'em®, and similar sample bags.

Whirl-Pak® (Nasco, Fort Atkinson, WI), Twirl'em® (Labplas, Ste.-Julie, QB, Canada), and similar polyethylene bags are excellent containers for many types of dry and wet samples, including parasites and tissues intended for histology. These bags are especially useful due to their light weight and thinness when empty, thus making them an excellent container choice for field collections or when shipment is required. Instructions regarding proper bag closure are not included with purchased bags but can be obtained from the manufactures' websites or through other contact with customer service personnel. Even so, four sets of instructions we thus obtained were all different and incorrect regarding the proper way to seal bags containing wet samples. With this in mind we have produced explicit directions for sealing bags to retain moisture and liquids. In short, proper bag use regarding wet samples requires: 1) a sample without sharp structures that may puncture the bag, 2) proper bag loading, i.e., proper proportions of sample, liquid fixative and air, 3) proper bag compression, and 4) proper bag closure. Executing these steps correctly will produce an enclosure that can undergo subsequent changes in pressure and remained well-sealed even when dropped or forcefully hurled against a hard substrate.

24. PEREZ, GINA R.[1],WILLIAM A. ROUMILLAT[1], ERIN LEVESQUE[1], AND ISAURE DE BURON[2]. [1]South Carolina Department of Natural Resources, Marine Resources Division, Inshore Fisheries Section, Charleston, SC. [2]Department of Biology, College of Charleston, Charleston, SC. Seasonal occurrence and ecology of the nematode *Philometra carolinensis*, an ovarian of spotted seatrout (*Cynoscion nebulosus*) in South Carolina.

Philometra carolinensis is a recently described philometrid nematode found in the female gonads of spotted seatrout (*Cynoscion nebulosus*). A study was carried out to determine the seasonal occurrence of this parasite associated with fish size (representing age), sexual maturity and physical parameters (water temperature and salinity). Female gonads were collected and dissected from a total of 446 spotted seatrout from January through December 2006. Overall prevalence of infection was 15.2% and mean intensity was 5.3 $\pm$ 0.13 worms. Parasites occurred only during spawning season from May through July with necrotic worms occurring in August. Infection peaked in June with a prevalence of 41.9% and a mean intensity of 6.1 $\pm$ 0.21 worms (n=117). Physical parameters were shown not to affect the occurrence of the nematode in the fish host. In July prevalence and intensity of infection dropped to 10.4% and 1.6 $\pm$ 0.18 worms. This data along with the fact that very few worms were ever found necrotic in the gonads suggested that the worms were expelled along with the host's eggs and that the parasite and the host life cycles are synchronized.

25. CROSS, CHERYL, E. C. RAMSAY, STEPHEN KANIA, ALY CHAPMAN, AND SHARON PATTON. University of Tennessee College of Veterinary Medicine, Knoxville, TN. *Echinococcus granulosus* in translocated elk in the Great Smoky Mountains National Park (GSMNP).

In 2000, the Tennessee Wildlife Resources Agency (TWRA) and the Rocky Mountain Elk Foundation began a restoration project to bring elk back into the southern Appalachian land they once inhabited. Over the next three years, elk were imported from Land Between the Lakes in Kentucky and Elk Island in Alberta, Canada. To date, five of the reintroduced elk have been

diagnosed at necropsy with pulmonary *Echinococcus granulosus* cysts. All necropsies were performed at the University of Tennessee College of Veterinary Medicine. All of the diagnosed elk originated/lived at Elk Island National Park before importation to Tennessee. Of the five definitive cases, three of the elk were found in Tennessee and the remaining two were found within the GSMNP or its boundary in North Carolina. A sixth elk from GSMNP had a suspicious region of fibrosis and inflammation within the lung; however, *E. granulosus* could not be confirmed grossly or histologically. The three elk found in Tennessee had two pulmonary cysts each. One elk from the GSMNP had four pulmonary cysts, and the second from GSMNP had six cysts. All confirmed cases were in adult females; the elk with a suspicious lesion was an adult male. In all cases, the pulmonary echinococcosis was considered an incidental finding. PCR of a cyst confirmed that the elk were infected with the sylvatic strain of *E. granulosus* previously described from Canadian elk. To date there is no evidence of transmission to wild canidae in Tennessee.

26. YABSLEY, MICHAEL J.[1,2] ULRIKE G. MUNDERLOH[3], STACI M. MURPHY[2], M. PAGE LUTTRELL[2], AND ELIZABETH W. HOWERTH[4]. [1]D.B. Warnell School of Forestry and Natural Resources, University of Georgia, Athens GA. [2]Southeastern Cooperative Wildlife Disease Study, Department of Population Health, College of Veterinary Medicine, University of Georgia, Athens GA. [3]University of Minnesota, Department of Entomology, St. Paul, MN. [4]Department of Pathology, College of Veterinary Medicine, University of Georgia, Athens GA. Isolation and partial characterization of a novel *Ehrlichia*-like species from raccoons (*Procyon lotor*).

Raccoons (*Procyon lotor*) have serologic and/or molecular evidence of infection with several ehrlichiae, including *Ehrlichia chaffeensis*, *E. canis*, *Anaplasma phagocytophilum*, and a novel *Ehrlichia*-like species. This novel *Ehrlichia*-like species was initially detected in free-ranging raccoons from Georgia, because it was amplified using PCR protocols for *A. phagocytophilum*. In this study, two captive raccoons (413 and 414) were experimentally infected with the novel *Ehrlichia*-like species by inoculation with PCR-positive whole blood from infected raccoons. Raccoons were infected for at least 87 days and at necropsy, blood, liver, and spleen were PCR positive. We cultured a novel intracellular bacterium from both of these two raccoons in ISE6 tick cells. Giemsa-stained cells sampled two and three months after initial inoculation of the cultures revealed inclusions similar to those of *Ehrlichia* sp., except that individual bacteria commonly were elongated. Transmission electron microscopic examination of infected cultures demonstrated elongate and spherical ehrlichiae-like organisms within membrane bound vacuoles. Sequencing of the 16S rRNA gene identified the microbes as the raccoon *Ehrlichia*-like agent previously detected in raccoons. Partial sequences were also obtained for the *groESL*, *gltA*, and *rpoB* genes. Phylogenetic analysis of *16S rRNA* and *groESL* sequences indicated that the raccoon ehrlichiae was most closely related to members of the '*Candidatus* Neoehrlichia mikurensis' previously detected in rodents from Japan and China and ticks from Japan and the Netherlands. Similarly, phylogenetic analysis of the *gltA* sequence indicated a close relationship with an ehrlichiae ('*Candidatus* Ehrlichia walkerii') detected in ticks from Italy, which is also closely related to the '*Candidatus* Neoehrlichia' group. Based on the unique genetic and morphologic characteristics and host range of this organism, we have proposed the name *Neoehrlichia lotor*.

27. PUNG, OSCAR J.[1], CHRISTINA E. JARROUS[1], MICAH H. LANCASTER, AND EDWARD D. BROWN[2]. [1]Department of Biology, Georgia Southern University, Statesboro, GA and [2]Department of Biology, University of Southern Mississippi, Hattiesburg, MS. Effect of temperature and culture medium on the in vitro reproduction and survival of *Microphallus turgidus* (Trematoda: Microphallidae).

The successful in vitro cultivation of adult trematodes could obviate the need for vertebrate hosts in the laboratory and facilitate studies on both the basic biology of the parasites and the development of antihelminthic drugs. The goal of our project was to measure the in vitro survival of *Microphallus turgidus* and its ability to produce eggs under different culture conditions. Grass shrimp (*Palaemonetes pugio*) infected with *M. turgidus* were collected in salt marshes on the Georgia coast. Shrimp were dissected in 0.7% saline to obtain metacercarial cysts. Cysts were washed 3 times with Hanks' Balanced Salt Solution containing penicillin and streptomycin and excysted overnight at 32 or 37°C. Excysted worms were cultured in RPMI-1640 supplemented with 20% chicken, horse or calf serum and antibiotics at 32 and 37°C in 24-well tissue culture plates. Parasites survived for at least 2 weeks under all conditions with the highest percent survival occurring in serum-supplemented media. Egg production and release was greatest in media containing 20% horse serum and peaked during the first few days in culture. Studies concerning egg infectivity and the kinetics of egg production in vitro are in progress. Partially funded by the NSF-REU Program (CHE-0552745).

28. SPENCER, JENNIFER A., CALVIN M. JOHNSON, MICHAEL TILLSON, SHARRON BARNEY, SARAH MAJOR, RAY DILLON, AND BYRON L. BLAGBURN. College Of Veterinary Medicine, Auburn University, Auburn, AL. Imunopathogenesis of feline heartworm infection.

Domestic cats are relatively resistant to the establishment of heartworm infection even when experimentally infected. This suggests that the nature of the immune response in cats plays a large role in feline heartworm infection. The goals of this study were to examine cytokine immune responses to the arrival and early death of *D. immitis* in the feline lung. Cats were divided into 2 major groups: short term (8 mo) and long term (16 mo), and 3 subgroups. All cats were infected with 100 L3. Group A (n=20) cats were treated monthly with selamectin. Group B (n=20) cats were treated every 2 weeks with ivermectin from 84 days p.i. to mimic natural early death of L5s. Group C (n=24) cats remained untreated to mimic natural maturation of worms. Enriched circulating lymphocytes (PBL) and cells obtained by bronchiolar lavage (BAL) were collected at 4, 6, 8 and 16 mo p.i. cDNA was prepared from these cells and assayed by reverse-transcriptase PCR for the presence of cytokine mRNA. The measured cytokines included γIFN, TNFα, IL-4, IL-5, IL-6 and IL-10, and were compared with G3PDH as a housekeeping gene. At 8 mo p.i., pulmonary airway histopathology lesion scores were more severe in Group C cats than in Group A cats, but were similar to those of Group B cats. Pulmonary vascular lesion scores were significantly different in all 3 groups with Group C being the most severe. The 16 mo p.i. histopathology lesion scores will be discussed. Expression of cytokine mRNA in both PBL and BAL samples was downregulated in Group C cats and upregulated in Group B cats when compared with Group A cats at both time (8 mo and 16 mo) periods.

29. LINDSAY, DAVID S.[1], DAVE GOODWIN[1], SHEILA M. MITCHELL[1] AND JEANNINE STROBL[2]. [1]Department of Biomedical Science and Pathology, Virginia Tech, Blacksburg, VA; [2]Department of Biomedical Sciences, Edward Via Virginia College of Osteopathic Medicine, Blacksburg, VA. Evaluation of the mood stabilizing agent valproic acid as a prevetative for toxoplasmosis in mice.

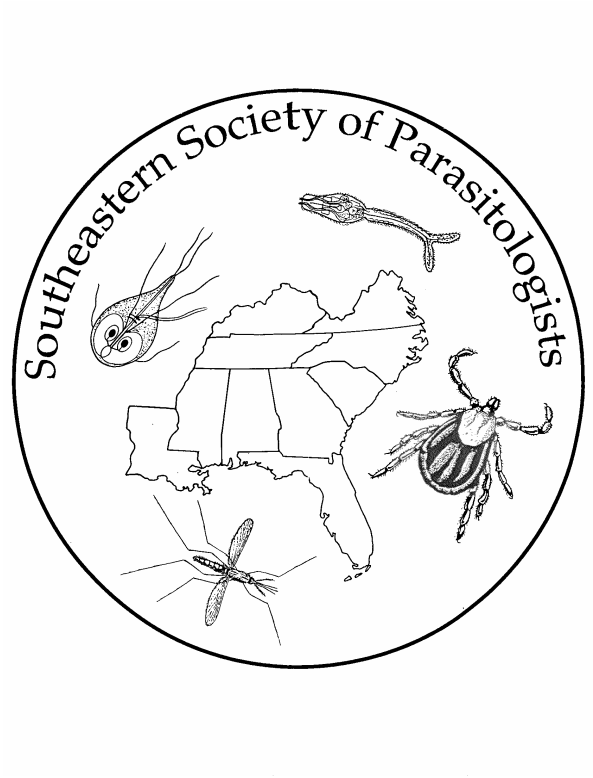
Toxoplasma gondii is a common intracellular protozoal infection of humans worldwide. Severe disease can occur in immunocompromised individuals and non-immune pregnant women can infect their offspring. Chronic infection is associated with decreased mental functions, vision and hearing problems and some mental disorders such as schizophrenia. The mood stabilizing agent valproic acid has been shown to inhibit the development of *T. gondii* in vitro at dosages that are normally achieved in the serum and cerebral spinal fluid of human patients and to have positive effects on the behavior of rats chronically infected with *T. gondii*. The present study was done to examine the in vivo activity of valproic acid against acute toxoplasmosis in mice. Two studies were done giving valproic acid in the drinking water at a concentration of 1.5 mg/ml (Experiment 1) or 3.0 mg/ml (Experiment 2). We substantiated that valproic acid is active in cell cultures against RH strain tachyzoites. Valproic acid was not effective in preventing acute toxoplasmosis. All mice treated with valproic acid died or were killed and did not significantly (P >0.05) live longer that the controls. Tachyzoites were demonstrated in the tissues of infected valproic acid treated mice. Our results indicate that valproic acid while being effective in vitro it is not effective when given to mice as a preventative.

30. DEREK A. ZELMER. Department of Biology and Geology, University of South Carolina Aiken, Aiken, SC. Host biology as a community process: parasites of *Lepomis gulosus* in Par pond, South Carolina.

Parasite infracommunities of freshwater fishes have been described as stochastic assemblages, in spite of the fact that predictable changes in parasite richness, and the abundance of individual parasite species as fish grow older/larger have been well documented. The hypothesis that predictable changes in the diet of larger fish hosts should be reflected in the parasite infracommunity as a nested-subset pattern was tested by examining the parasites of warmouth (*Lepomis gulosus*) collected in November of 2006 from Par Pond, on the Savannah River Site near Aiken, SC. The addition of parasites utilizing larger prey items as intermediate hosts, to a baseline infracommunity of parasites that infect hosts by penetration, attachment, or ingestion of small prey items, produced a nested-subset pattern of infracommunity structure in the warmouth hosts.

31. ROSYPAL, ALEXA C.[1], RICHARD R. TIDWELL[1], AND DAVID S. LINDSAY[2]. [1]Department of Pathology and Laboratory Medicine, School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC. [2]Department of Biomedical Sciences and Pathobiology, Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech, Blacksburg, VA. Seroprevalence of *Leishmania infantum* and *Trypanosoma cruzi* in wild canine populations in South Carolina.

Wild canids are reservoir hosts for *Leishmania infantum* and *Trypanosoma cruzi*. The present study examined the prevalence of antibodies to these zoonotic parasites in a population of wild canids from a nonagricultural setting in South Carolina. Sera from 26 gray foxes (*Urocyon cinereoargenteus*) and 2 coyotes (*Canis latrans*) were examined for antibodies to *L. infantum* and *T. cruzi* using the indirect immunofluorescent antibody test (IFAT) and commercially available parasite-specific immunochromatigraphic strip assays. Antibodies to *L. infantum* were not detected by either assay in gray foxes or coyotes. Two (8%) of 26 gray foxes were positive in both the *T. cruzi* IFA and strip assays. Antibodies to *T. cruzi* were not detected in coyotes. Results from this study indicate that gray foxes are exposed to *T. cruzi*, but not *L. infantum* in this geographic region.



NOTES

NOTES

Southeastern Society of Parasitologists

Award Recipients

Meritorious Service Award

1983 Robert B. Short
1985 James H. Oliver, Jr.
1986 A.B. Weathersby
1990 Grover C. Miller
1991 Burton J. Bogitsh
1996 Sharon Patton
1999 John Richard Seed
2004 Gail P. Noblet

Byrd-Dunn Award

1975 William F. Font
1976 Hugh M. Turner
1977 Raymond S. Kutzman
1978 Kenneth S. Saladin
1979 Dean S. Cunningham
1980 Gregory F. Mathis
1981 Oliver J. Booker, III
1982 Steve J. Upton
1983 Wesley L. Shoop
1984 Dennis E. Kyle
1986 Cheryl D. Davis
1987 Charles T. Faulkner
1988 Victoria H. Mann
1989 Constance E. Bell
1990 Sheila A. Peel
1991 Sara R. Davis
1992 Fred J. Herndon
1993 Rebecca A. Cole and Chrystal L. Mars
1994 Lance W. Fontenot
1995 Julia S. Jackson
1996 Vina R. Diderrich
1997 Derek A. Zelmer
1998 Chris A. Hall
1999 Kelly Still
2000 Michael Barger and Allison K. Witherow
2001 Megan R. Collins
2002 Deborah M. Lai
2003 Alyssa Kunz
2004 Michael J. Yabsley
2005 Francisco Palomeque
2006 Tiffany G. Baker

President's Award

1986 Mary C. Dunn