

## CURRICULUM VITAE

**Name:** Hugh Scott Hammer

**Date of Birth:** November 22, 1969  
Columbus, Ohio

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### EDUCATION

- 2006 Ph.D. Department of Biology, University of Alabama at Birmingham. Title of Dissertation: "Determination of dietary protein, carbohydrate, and lipid requirements for the sea urchin *Lytechinus variegatus* fed formulated feeds."
- 1998 M.S. Department of Biology, University of Alabama at Birmingham. Title of Thesis: "Developmental expression of digestive enzymes in *Procambarus clarkii* (Girard 1852) (Crustacea: Decapoda)."
- 1992 B.S. Biology (major) Chemistry (minor) and General Sciences (minor), Bowling Green State University, Bowling Green, Ohio.

### PROFESSIONAL EXPERIENCE

- 2006- Present Adjunct Faculty at Dauphin Island Sea Lab, AL teaching Marine Aquaculture Summer Course
- 2004 Visiting Scientist (Fall, 2004): Texas A&M Experimental Station, Port Aransas, Texas. Nutritional requirements of sea urchins.
- 2001-Present Program Manager and Aquaculture Instructor  
Aquaculture Education and Development Center (AEDC), Science Division, Gadsden State Community College, Gadsden, AL

## **PROFESSIONAL EXPERIENCE (CONT.)**

- Introduction to Aquaculture (FHS 101)  
Water Chemistry for Aquaculture (FHS 102)  
Aquaculture Hatchery/Pond Management (FHS 114)  
Biology and Diseases of Aquaculture Species (FHS 112)  
Aquaculture Practicum I (FHS 140)  
Aquaculture Practicum II (FHS 141)
- 1998                      Visiting Scientist USCGC Polar Sea Cruise. “Drugs from the Sea”  
Collected and catalogued marine invertebrates for secondary  
metabolite research.
- 1995-2000                Teaching/Research Assistant, Department of Biology and School  
of Health Related Professions, University of Alabama at  
Birmingham, Birmingham, AL
- Biology Lab (BY 103L)  
Human Physiology Lab (BY 116L)  
Human Anatomy Lab (BY 115L)  
Gross Anatomy for Surgical Assistants (SA330)  
Gross Anatomy for Nurse Anesthesia (NA601)  
Neuroanatomy for Surgical Assistants (SA331)  
Guest lecturer for Human Anatomy (BY 115)  
Guest lecturer for Cell Biology (2 lectures) (BY330)
- 1994                      Shrimp Pathology Certificate, University of  
Arizona, Tucson, Arizona.
- 1993-1995                Research laboratory supervisor, Gulf Coast Research Laboratory,  
Ocean Springs, Mississippi

## **RESEARCH INTERESTS**

- Fish and invertebrate nutrition and aquaculture
- Echinoid nutrition and culture
- Aquaculture engineering and recirculating aquaculture systems
- Fish and invertebrate pathogens in aquaculture

## PUBLICATIONS

### Papers

1. Gibbs, V.K., Powell, M.L., Hammer, H.S., Jones, W.T., and Watts, S.A. 2012. Evaluation of menhaden oil and soybean oil levels in purified diets on growth and gonad production in adult sea urchin, *Lytechinus variegatus*. North American Journal of Aquaculture. (In press)
2. Hammer, H.S., Watts, S.A., Powell, M.L., Jones, W., Gibbs, V.K., Lawrence, J.M., and Lawrence, A.L. (2012). The effect of dietary protein concentration on the growth and gonad production of the sea urchin *Lytechinus variegatus*. J. World Aquaculture 43(2), 145-158.
3. Watts, R.J., S.A. Watts, H.S. Hammer, M.S. Scott and T.R. Nagy. (in press). Validation of dual-energy X-ray absorptometry (DXA) to predict body composition of channel catfish, *Ictalurus punctatus*. J. World Aqua. Soc.
4. Jones WT, ML Powell, VK Gibbs, HS Hammer, JM Lawrence, J Fox, AL Lawrence, and SA Watts. 2010. The Effect of Dietary Selenium on Weight Gain and Gonad Production in the Sea Urchin, *Lytechinus variegatus*. Journal of the World Aquaculture Society. 41(5): 675-686.
5. Jones, W.J., M.L. Powell, V.K. Gibbs, H.S. Hammer, S.A. Watts, A.L. Lawrence and J.M. Lawrence. 2010. Evaluation of the effect of dietary zinc, iron, and manganese supplementation on growth and survival of the sea urchin *Lytechinus variegatus*. In Harris, L.G, S.A. Boettger, C.W. Walker and M.P. Lesser (eds.) Proceedings of the 12th International Echinoderm Conference, Durham, New Hampshire. CRC Press/Balkema. pp. 385-390.
6. Gibbs, V.K., M.L. Powell, H.S. Hammer, W.T. Jones, S.A. Watts, A.L. Lawrence and J.M. Lawrence. 2010. Effects of dietary phospholipids and cholesterol on growth and organ production in the sea urchin, *Lytechinus variegatus*. In Harris, L.G, S.A. Boettger, C.W. Walker and M.P. Lesser (eds.) Proceedings of the 12th International Echinoderm Conference, Durham, New Hampshire. CRC Press/Balkema. pp. 369-375.
7. Powell, M.L., W.T. Jones, V.K. Gibbs, H.S. Hammer, S.A. Watts, J.M. Lawrence and A.L. Lawrence. 2010. Effect of dietary calcium, magnesium and phosphorus on growth of the sea urchin *Lytechinus variegatus*. In Harris, L.G, S.A. Boettger, C.W. Walker and M.P. Lesser (eds.) Proceedings of the 12th International Echinoderm Conference, Durham, New Hampshire. CRC Press/Balkema. pp. 391-396.

## Papers (cont.)

8. Hammer, H.S., M.L. Powell, V.K. Gibbs, W.T. Jones, S.A. Watts, A.L. Lawrence, J.M. Lawrence, and L.R. D'Abramo. 2010. Effect of dietary menhaden oil and soy oil on consumption, somatic growth and gonad production of the sea urchin, *Lytechinus variegatus*. In Harris, L.G, S.A. Boettger, C.W. Walker and M.P. Lesser (eds.) Proceedings of the 12th International Echinoderm Conference, Durham, New Hampshire. CRC Press/Balkema. pp. 377-383.
9. Hammer, H.S., Watts, S.A., Lawrence, A.L., and Lawrence, J.M., Desmond, R.A. (2006) The effect of dietary protein on consumption, survival, growth and production of the sea urchin *Lytechinus variegatus*. *Aquaculture* 254, 483-495.
10. Hammer, H.S., Hammer, B.W., Watts, S.A., Lawrence, A.L., Lawrence, J.M. (2006) The effect of dietary protein and carbohydrate concentration on the biochemical composition and gametogenic condition of the sea urchin *Lytechinus variegatus*. *Journal of Experimental Marine Biology and Ecology* 334, 109-121.
11. Hammer, B.W., Hammer, H.S., Watts, S.A., Desmond, R.A., Lawrence, J.M., and Lawrence, A.L. (2004) The effect of dietary protein concentration on feeding and growth of small *Lytechinus variegatus* (Echinodermata: Echinoidea). *Marine Biology*, 145, 1143-1157.
12. Hammer, H.S., Bishop, C.D., and Watts, S.A. (2004). Characterization of three digestive enzymes in the crayfish *Procambarus clarkii*. *Journal of the Alabama Academy of Science*, 74(1), 47-59.
13. Hammer, H.S., Bishop, C.D., and Watts, S.A. (2000). Activities of three digestive enzymes during development in the crayfish *Procambarus clarkii* Girard (Crustacea: Decapoda). *Journal of Crustacean Biology*, 20(4) 614-620.
14. Hammer, H.S., Stuck, K.C. and Overstreet, R.M. (1998). Infectivity and pathogenicity of Baculovirus penai (bp) in cultured larval and postlarval pacific white shrimp, *Penaeus vannamei*, related to the stage of viral development. *Journal of Invertebrate Pathology*, 72, 38-43.
15. Powell, M.L., Hammer, H.S. and Watts, S.A. (1998). Observations of claw loss in two crayfish ponds. *J. World Aquaculture* 29(4), 485-490.

## **In Preparation**

1. Watts, S., Bailey, S., Hammer, H., The use of dual-energy x-ray absorptiometry to determine body composition in the tilapia, *Oreochromis niloticus*.
2. Hammer, H.S., Hammer, B.W., Watts, S.A., Adams, T.B., Guthrie, C.L., Lawrence, J.M., and Lawrence, A.L. The effect of dietary protein and marine and total fat concentrations on the digestibility of formulated feeds for the sea urchin *Lytechinus variegatus*.

## **SOURCES AND LEVEL OF SUPPORT**

### **Research and Education**

- |           |  |
|-----------|--|
| 2012      | Secured over \$60,000 dollars in materials from vendor partners for the Zebrafish Husbandry Education course and curriculum development. Four different vendor husbandry racks are onsite. |
| 2012      | Coosa Valley RC&D Council, Fighting Back Climate: A Demonstration in Growing Unique Out-of-Season Aquaculture Crops for Niche Markets in Alabama. \$6,000                                  |
| 2012      | Secured \$10,000 in start-up funds from a partnership with the University of Alabama at Birmingham for a Zebrafish Husbandry Education course and curriculum development                   |
| 2012      | Southern Regional Aquaculture Center, Extension Publication Award. Species Profile: Sea Urchins. \$2000  |
| 2011      | GSCC Margin of Excellence Grant: Quality job opportunities for biomedical techs using zebrafish \$2,298.70 Awarded March 29, 2011  |
| 2009-2011 | Sub-Award Co-PD USDA Secondary Agriculture Education Challenge Grant “Developing Online Aquaculture Curricula” Auburn University \$46,915  |
| 2008-2010 | Awarded USDA Secondary Agriculture Education Challenge Grant “Teaching, Research, and Web-Enhanced Learning Experiences Within a Post-Secondary Aquaculture Curriculum \$33,636.           |
| 2008      | Awarded Education Grant from Coosa Valley RC&D Council “ Citizen Anglers” Amount. \$3,500.   |

### **Research and Education (cont.)**

- 2007            Awarded Education Grant from Coosa Valley RC&D Council “Promoting the Education of Citizen Anglers through HOFNOD” Amount. \$3,500.
- 2005-2007      Awarded USDA Secondary Agriculture Education Challenge Grant “Enhancing Technical Competency Through Pathways in Aquatic Science.” Principal Investigator. Amount \$32,811.
- 2003            Awarded Appalachian Regional Commission Grant “Entrepreneurial Opportunities for Rural Alabama Farmers through the Aquaculture of Alternative Species.” \$200,000. This grant was denied by GSCC as matching funds for this grant were cut from GSCC AEDC operational budget by Alabama Legislature fiscal year 2003-2004.
- 2002-2004      Awarded AACC/NSF “GSCC Aquatic Mentorlinks Grant” AACC-NSF-0207. Principal Investigator. Amount \$9,500.
- 2001-2004      Co-Principal Investigator and Project Manager NSF ATE Grant “Strengthening Aquatic Science Programs in Secondary Schools and Community Colleges.” \$370,876
- 2002            Awarded USDA Challenge Grant “Cage Culture of Tilapia in North-Central Alabama.” Co-Principal Investigator. Amount \$2,450.
- 1999            Awarded Alabama Academy of Science Grant in Aid of Research. \$125 for “Digestive enzymes in the sea urchin *Lytechinus variegatus*.”
- 1995            Awarded Alabama Academy of Science Grant in Aid of Research \$250 for “Dietary and Developmental Expression of Digestive Enzymes in the red swamp crayfish *Procambarus clarkii*.”
- 1995            Awarded Sigma Xi Research Grant \$350 for “Dietary and developmental expression of digestive enzymes in the red swamp crayfish *Procambarus clarkii*.”

### **Travel and Housing**

- 2000            Society for Integrative and Comparative Biology. Housing waiver for meeting in Atlanta, Georgia.

### **Travel and Housing (Cont.)**

- 2000            Awarded Graduate Student Association Travel Grant \$100 to attend Society for Integrative and Comparative Biology meeting in Atlanta, Georgia.
- 1999            Society for Integrative and Comparative Biology. Housing waiver for meeting in Denver, Colorado.
- 1999            Alabama Academy of Science \$35 to attend meeting in Athens, Alabama.
- 1997            Awarded Graduate Student Association Travel Grant \$100 to attend Society for Integrative and Comparative Biology meeting in Albuquerque, New Mexico.
- 1996            Awarded \$100 from Aquaculture America to attend Aquaculture America meeting in Dallas, TX.
- 1996            Awarded Graduate Student Association Travel Grant \$100 to attend 1996 American Society of Zoologist meeting in Washington D.C.

### **PROFESSIONAL SOCIETIES**

Zebrafish Husbandry Association  
American Association of Laboratory Animal Scientists  
US Freshwater Prawn and Shrimp Growers Association  
Alabama Catfish Producers  
Florida Aquaculture Association  
Society for Integrative and Comparative Biology  
International Association of Astacology  
Crustacean Society  
World Aquaculture Society  
US Aquaculture Society  
American Tilapia Association  
Alabama Fisheries Association  
Alabama Association of Catfish Producers  
Sigma Xi

### **PROFESSIONAL AND COMMUNITY SERVICE**

- 2012            Organized, coordinated, and facilitated the first Zebrafish Husbandry Education Curriculum Development Workshop at GSCC hosting 18 world experts in zebrafish husbandry, colony management, disease, and compliance. The 3 day/ 4 night workshop designed a new online curriculum for the fasted growing animal model in medical research.

## **PROFESSIONAL AND COMMUNITY SERVICE (CONT.)**

- 2012 Invited speaker UAB Marine Biology Club
- 2012 Invited Scientist: University of Ibague, Ibague Colombia (6 days)
- 2012 Alabama Fisheries Association President
- 2011 Invited speaker UAB Marine Biology Club
- 2011 Alabama Fisheries Association (AFA) President-Elect organizing, coordinating, scheduling, facilitating the annual AFA meeting. 3-days (2 night) meeting with accommodations, 7 sessions (36 speakers), banquets, and socials
- 2010 Invited extension presentation: “Yellow Perch and Tilapia Aquaculture” Alabama Fish Farming Center, Greensboro AL
- 2010- Present Peer Reviewer for the USDA Small Business Innovative Research grant program Aquaculture Specialty
- 2009 Hosted Visiting Scientist from Birmingham Southern College. Dr. Andrew Gannon Research Sabbatical (6 mos)
- 2009 Peer Reviewer Committee for Secondary Post-Secondary Education Challenge Grants USDA. Met in Washington D.C. to evaluate grants
- 2008 Co-author and reviewer for the Alabama Agriscience/Aquaculture Curriculum
- 2008 Invited Scientist: University of Arkansas Pine Bluff (2 days)
- 2008 Invited Speaker: Auburn University Department of Fisheries and Allied Aquacultures (Lunch Seminar Series)
- 2007-Present Participated in “Renew the Coosa” Environmental Clean up
- 2006-Present Peer Reviewer for the journal “Aquaculture”
- 2006-Present Peer Reviewer for the “Journal of the World Aquaculture Society”
- 2006-2010 Treasurer Alabama Fisheries Association



## **PROFESSIONAL AND COMMUNITY SERVICE (CONT.)**

- 2006 Organized and Facilitated Workshop to Promote “Hooked on Fishing Not on Drugs (HOFNOD) project for Alabama Department of Wildlife and Freshwater Fisheries
- 2006 Organized and facilitated a 5-day workshop “Advanced Recirculating Aquaculture” for K12 Teachers
- 2006, 2008 Presentation to Gadsden Civitan Club
- 2005 Presentation to Alabama Agriscience Teachers Convention, Birmingham, AL
- 2004 Presentation to Gadsden Rotary Club
- 2004 Presentation to Gadsden Master Gardeners
- 2004 Presentation to Gadsden Lion’s Club
- 2004, 2009 Presentation to Gadsden Kiwanis Club
- 2004 Presented and assisted in the facilitation of K12 teacher workshop “Building and Using Recirculating Aquaculture Systems for Classroom Instruction.” Auburn University.
- 2004 Organized and moderated the Aquatic Education Section of the Alabama Fisheries Association meeting.
- 2003 K-12 Teacher Workshop “Using Aquascience as a Teaching Tool” for “Alabama Science in Motion.”
- 2002-Present Volunteer instructor and Coordination for Etowah and St. Clair County “Ground Water Festivals.”
- 2002 Taught workshop “Introduction to Home Aquariums” for Gift to Gadsden through First United Methodist Church, Gadsden.
- 2001-2003 Facilitated annual high school teacher workshop entitled “Growing Fish in Recirculating Systems Workshop and Curriculum Development.”(10 yrs)  
2005-2011
- 2001-Present Facilitator and Board Member for Etowah County Water Festival teaching over 1,200 4<sup>th</sup> grade students about the importance of water resources annually using three hands-on learning experiences (over 15,000 to date)

## **PROFESSIONAL AND COMMUNITY SERVICE (CONT.)**

- 2001-Present Annual visitation of over 1000 persons to GSCC Aquaculture Education and Development Center for educational/recreational activities.
- 2001-Present Professional aquaculture consulting for the community.
- 2001-Present Taught over 1500 classroom hours in K-12 biology classrooms.
- 2001 Community workshops entitled “Freshwater Shrimp Aquaculture,” “Backyard Koi Ponds,” “Breeding Tilapia in the Classroom,” “Recreational Pond Management,” “Water Chemistry for Aquaculture.”
- 2001-2008 Volunteer instructor for regional Earth Day activities in Birmingham and Anniston.
- 2001-2002 Team-taught AP Biology-Dual Enrollment for Gadsden High School.
- 2000 High school teacher workshop in Human Anatomy.
- 2000 High school teacher workshop for Project LIFE through NSF GK-12.
- 1999 Volunteered 12 contact hours in OT and Medical School Gross Anatomy.
- 1998-2001 Senator, Graduate Student Association (GSA) University of Alabama at Birmingham.
- 1997 Tutored UAB athletes for BY 115 and BY 116.
- 1996-2000 Volunteered over 300 contact hours in BY115 help sessions.
- 1996 Presentation to Talladega College, MARC program. “A preliminary survey of digestive enzymes in juvenile red swamp crayfish, *Procambarus clarkii*.”

## **PROFESSIONAL HONORS**

- 2007 Keep Etowah County Beautiful Environmental Award for Outstanding Service to Environmental Causes.
- 2005 Honorary State of Alabama FFA Degree for exemplary service to the FFA and educational community.
- 2000 Outstanding Student Award, Sea Urchin Aquaculture Meeting, Sardinia, Italy (500\$ cash prize).

## **PROFESSIONAL HONORS (CONT.)**

- 2000 Alabama Academy of Science, Best Student Paper presentation in the biological sciences section (25\$ cash prize).
- 2000 NSF GK-12 Teaching Fellowship (\$18,000 annual stipend and \$10,500 annual educational allowance).
- 1999 Sigma Xi Graduate Student Research Day, 1999; Third place for best paper (cash prize \$100).
- 1997-98 Outstanding Graduate Student Department of Biology, University of Alabama at Birmingham 1997-98.

## **ABSTRACTS OF PAPERS AND POSTERS PRESENTED AT MEETINGS**

1. Hammer, H.S., Watts, S.A., Cartner, S.C., Farmer, S., Rath, M. A Unique approach to creating a new post-secondary aquaculture curriculum to address the education of zebrafish husbandry technicians in biomedical research facilities. World Aquaculture Society Meeting , Nashville, TN. (oral presentation)
2. Hammer, H.S., Watts, S.A., Cartner, S.C., Farmer, S., Rath, M., Jolly, J., Gallardo, M., Sears, D., Davis, S. 2013. An update on zebrafish husbandry education efforts by Gadsden State Community College, The University of Alabama at Birmingham, and a community of scholars. World Aquaculture Society Meeting, Nashville, TN. (oral presentation)
3. Hammer, H.S., Watts, S.A., Cartner, S.C., Farmer, S., Rath, M. 2012. Schooling fish: a new program to facilitate husbandry training for zebrafish. AALAS Meeting. Minneapolis, MN. (oral presentation)
4. Hammer, H.S., Koike, B. 2010 “Where Schooling Really Counts: The Development of Zebrafish Husbandry Instruction” New Orleans, LA (oral presentation)
5. Hammer, H.S., D. Cline, C. Reeves, P. Waters. 2007. Teaching Biology Using An Aquaculture Framework. World Aquaculture Society. San Antonio, TX. (oral presentation)
6. Gibbs, V.K., S.A. Watts, A.L. Lawrence, M.L. Powell, H.S. Hammer, W.T. Jones, J.M. Lawrence. 2006. The effects of dietary cholesterol and phospholipids on growth and reproduction in the sea urchin *Lytechinus variegatus*. National Shellfish Association Abstracts. pg.41.

**ABSTRACTS OF PAPERS AND POSTERS PRESENTED AT MEETINGS  
(CONT.)**

7. Hammer, H.S., S.A. Watts, A.L. Lawrence, M.L. Powell, W.T. Jones, V.K. Gibbs, and J.M. Lawrence. 2006. Effect of dietary protein on consumption, growth and production of the sea urchin *Lytechinus variegatus*. National Shellfish Association Abstracts. pg.45.
8. Jones, W.T., M.L. Powell, V.K. Gibbs, H.S. Hammer, J.M. Lawrence, A.L. Lawrence and S.A. Watts. 2006. Effect of dietary selenium on the sea urchin *Lytechinus variegatus*. National Shellfish Association Abstracts. pg.52.
9. Powell, M.L., W.T. Jones, V.K. Gibbs, H.S. Hammer, S.A. Watts, J.M. Lawrence and A.L. Lawrence. 2006. Copper is an essential nutrient and potential toxicant in the diet of the sea urchin *Lytechinus variegatus*. National Shellfish Association Abstracts. pg. 74.
10. Lawrence, A. L., J. M. Lawrence, S. A. Watts, M. L. Powell, W. T. Jones, H. S. Hammer, V. K. Gibbs. 2006. Development of and significance of semi-purified and purified feeds (diets) for sea urchins. 12<sup>th</sup> International Echinoderm Conference. University of New Hampshire. pg. 41.
11. Hammer, H., S. Watts, W. Jones, V. Gibbs, M. Powell, A. Lawrence, L. D'Abramo, J. Lawrence. 2006. Effect of dietary menhaden oil and soy oil on consumption, somatic growth, nutrient digestibility and gonad production of the sea urchin *Lytechinus variegatus*. 12<sup>th</sup> International Echinoderm Conference. University of New Hampshire. pg. 81.
12. Jones, W. T., M.L. Powell, S.A. Watts, V.K. Gibbs, H.S. Hammer, A.L. Lawrence, J.M. Lawrence. Effect of dietary iron, zinc and manganese on growth in the sea urchin *Lytechinus variegatus*. 2006. 12<sup>th</sup> International Echinoderm Conference. University of New Hampshire. pg. 38.
13. Powell, M. L., W. T. Jones, V. K. Gibbs, H. S. Hammer, Addison L. Lawrence, and Stephen A. Watts. 2006. Effect of dietary calcium, magnesium and phosphorus on growth of the sea urchin *Lytechinus variegatus*. 12<sup>th</sup> International Echinoderm Conference. University of New Hampshire. pg. 51.
14. Gibbs, V. K., S. A. Watts, A. L. Lawrence, M. L. Powell, H. S. Hammer, W. T. Jones, and J. M. Lawrence. 2006. Dietary Phospholipids Affect Growth and Production of the Sea Urchin, *Lytechinus variegatus*, 12<sup>th</sup> International Echinoderm Conference. University of New Hampshire. pg.30.

**ABSTRACTS OF PAPERS AND POSTERS PRESENTED AT MEETINGS  
(CONT.)**

15. Hammer, H.S. 2005. Strengthening aquatic science programs in secondary schools and community colleges; the next step. Alabama Fisheries Association.
16. Powell, M.L., W.T. Jones, V.K. Gibbs, H.S. Hammer, J.M. Lawrence, A.L. Lawrence and S.A. Watts. 2005. Copper is an essential micronutrient in the sea urchin *Lytechinus variegatus*. J. Ala. Acad. Sci. 76(2), 100.
17. Watts, R.J. and S.A. Watts, T.R. Nagy and H.S. Hammer. 2005. Fat distribution in fed and starved channel catfish, *Ictalurus punctatus*. J. Ala. Acad. Sci. 76(2), 105.
18. Jones, W.T., V.K. Gibbs, M.L. Powell, H.S. Hammer, J.M. Lawrence, A.L. Lawrence, and S.A. Watts. 2005. Selenium toxicity in the regular sea urchin *Lytechinus variegatus*. J. Ala. Acad. Sci. 76(2), 106.
19. Hammer, H.S. 2005. Strengthening aquatic science programs in secondary schools and community colleges. US Aquaculture Society.
20. Hammer, H.S., Adams, T., Brookes, J. 2005. Aquaculture Technical Training at the Gadsden State Community College Aquaculture Education and Development Center. US Aquaculture Society.
21. Hammer, H.S., B. Hammer, S.A. Watts, J.M. Lawrence, A. Lawrence. 2005. Dietary protein affects growth of cultured sea urchins. Aquaculture America, New Orleans, LA.
22. Hammer, H.S. 2004. Gadsden State Community College Aquaculture Education and Development Center. Regional Aquarist Workshop.
23. Falls, W., Hammer, H., Koike, B., Anderson, J., McMullian, A., Crochet, G., Holland, D., Smith, T., Jacobson, T., Hartman, M. 2004. The role of community colleges in aquaculture education. World Aquaculture Society.
24. Hammer, H.S. 2004. Gadsden State Community College Aquaculture Education and Development Center. Alabama Fisheries Association.
25. Hammer, H.S. 2004. Strengthening aquatic science programs in secondary schools and community colleges. Alabama Fisheries Association.
26. Watts, R.J., Watts, S.A., Hammer, H.S., Johnson, M.S. and T.R. Nagy. 2004. The use of dual-energy x-ray absorptiometry to determine body composition in fish. J. Ala. Acad. Sci. 76(2), 70.

**ABSTRACTS OF PAPERS AND POSTERS PRESENTED AT MEETINGS  
(CONT.)**

27. Watts, S.A., H.S. Hammer and P. Kennedy. 2002. Cage culture of GMT® tilapia in North Alabama. Alabama Fisheries Association, Gulf Shores, Alabama.
28. Wallace, B.D., A.W. Cunningham, H.S. Hammer, S.A. Watts, J.M. Lawrence and A.L. Lawrence. 2001. The effect of protein on gonad development in small sea urchins (*Lytechinus variegatus*). 2001 North American Echinoderm Conference, University of Maine.
29. Wallace, B.D., H.S. Hammer, S.A. Watts, J.M. Lawrence and A.L. Lawrence. 2001. The effect of dietary protein concentration on the growth of juveniles of the sea urchin *Lytechinus variegatus*. Society for Integrative and Comparative Biology. 40 (6), 1248.
30. Hammer, H.S., S.A. Watts, J.B. McClintock, J.M. Lawrence and A.L. Lawrence. 2001. The effect of dietary protein concentrations on gonad composition and gametic condition in the sea urchin *Lytechinus variegatus*. Society for Integrative and Comparative Biology. 40 (6), 984.
31. Wallace, B.D., H.S. Hammer, S.A. Watts, J.B. McClintock, J.M. Lawrence and A.L. Lawrence. 2001. The effects dietary protein diets on growth of juvenile sea urchins. World Aquaculture Society, Orlando, Florida.
32. Hofer, S.C., B. Wallace, H. Hammer, R. Worrell, J. Owens, M. Powell, M. Drackett, S. Abernathy and S.A. Watts. 2001. Low temperature tolerance in fingerling GMT *Oreochromis niloticus*. World Aquaculture Society, Orlando, Florida.
33. Hammer, H.S., S.A. Watts, J.B. McClintock, J.M. Lawrence and A.L. Lawrence. 2000. The effects of dietary protein on the production and proximate composition of gonads in the sea urchin *Lytechinus variegatus*. J. Ala. Acad. Sci. 71, 3.
34. Hammer, H.S., S.A. Watts, J.B. McClintock, J.M. Lawrence and A.L. Lawrence. 1999. Dietary protein affects consumption, gonad production and survivorship in the echinoid *Lytechinus variegatus*. Amer. Zool. 39 (5), 95A.
35. Hammer, H.S. and S.A. Watts. 1999. Digestive enzymes in the gut of the sea urchin *Lytechinus variegatus*. Fifth International Congress of Comparative Physiology Biochemistry, Calgary, Alberta.
36. Hammer, H.S. and S.A. Watts. 1999. A preliminary determination of three digestive enzymes in the sea urchin *Lytechinus variegatus*. J. Ala. Acad. Sci. 70 (1,2), 10.

## **ABSTRACTS OF PAPERS AND POSTERS PRESENTED AT MEETINGS (CONT.)**

37. Hammer, H.S., S.A. Watts and C.D. Bishop. 1998. Developmental expression of digestive enzymes in *Procambarus clarkii*. Amer. Zool. 38(5), 167A.
38. Powell, M.L., H.S. Hammer and S.A. Watts. 1998. Incidence of claw loss in the crayfish *Procambarus clarkii* in culture ponds. Amer. Zool. 37 (5), 192A.
39. Hammer, H.S., C.D. Bishop and S.A. Watts. 1998. A characterization of three digestive enzymes from the red swamp crayfish *Procambarus clarkii*. J. Ala. Acad. Sci. 69(2), pp. 67.
40. Hammer, H.S., C.D. Bishop and S.A. Watts. 1997. A preliminary survey of digestive enzymes in hatchling *Procambarus clarkii*. International Association of Astacology, 11<sup>th</sup> Symposium.
41. Meade, M.E., H.S. Hammer, M.L. Powell and S.A. Watts. 1997. Aquaculture of red swamp crayfish using non-forage based feeding regimes. World Aquaculture Society. pp. 324.
42. Powell, M.L., H.S. Hammer and S.A. Watts. 1997. Demographics of claw loss and regeneration in the crayfish, *Procambarus clarkii*. World Aquaculture Society. pp. 374.
43. Hammer, H.S., C.D. Bishop and S.A. Watts. 1997. Ontogeny of digestive enzymes in the red swamp crayfish, *Procambarus clarkii*. World Aquaculture Society. pp. 193.
44. Hammer, H.S., C.D. Bishop and S.A. Watts. 1996. A preliminary survey of digestive enzymes in juvenile red swamp crayfish, *Procambarus clarkii*. J. Ala. Acad. Sci. 67, pp. 55.
45. Stuck, K.C., H.S. Hammer and R. M. Overstreet. 1994. Preliminary Study on the infectivity of shrimp baculovirus related to viral period of development. Mississippi Academy of Science.

## **PROFESSIONAL MEETINGS ATTENDED**

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| 2012 | AALAS Meeting, Minneapolis, MN                        |
| 2012 | US Aquaculture Meeting, Las Vegas, NV                 |
| 2012 | Alabama Fisheries Association Meeting, Columbiana, AL |

**PROFESSIONAL MEETINGS ATTENDED (CONT.)**

2011 Alabama Fisheries Association Meeting, Mobile, AL

2011 US Aquaculture Meeting, New Orleans, LA

2010 Alabama Fisheries Association Meeting. Florence, AL

2009 US Freshwater Shrimp and Prawn Growers Association Meeting,  
Tunica, MS

2009 Alabama Fisheries Association Meeting, Auburn, AL

2008 Alabama Catfish Producers Meeting, Demopolis, AL

2008 Alabama Science Teachers Association, Birmingham, AL

2008 US Freshwater Shrimp and Prawn Growers Association Meeting,  
Raleigh, NC

2007 Alabama Fisheries Association, Gulf Shores, AL

2007 World Aquaculture Society Meeting, San Antonio, TX

2006 US Freshwater Shrimp and Prawn Growers Association Meeting,  
Nashville, TN

2006 USDA SPEC Grants Meeting, Atlanta, GA

2006 Alabama Fisheries Association, Gulf Shores, AL

2005 US Aquaculture Society, New Orleans, LA

2005 Alabama Fisheries Association, Auburn, AL

2004 Regional Aquarist Workshop, Sarasota, FL

2004 World Aquaculture Society, Honolulu, Hawaii.

2004 Alabama Fisheries Association, Gulf Shores, Alabama.

2004 NSF Mentorlinks and ATE meeting, Washington, D.C.

2003 US Aquaculture Association, Louisville, Kentucky.



## **PROFESSIONAL MEETINGS ATTENDED (CONT.)**

- 2003 NSF Mentorlinks and ATE meeting, Washington, D.C.
- 2003 NSF ATE Regional Meeting, Huntsville, AL.
- 2003 Florida Aquaculture Association, Florida Tropical Fish Farmers Association, Public Aquarium Marine Fish Health Seminar meetings, Tampa, Florida.
- 2003 Alabama Fisheries Association, Auburn, Alabama.
- 2002 NSF ATE meeting, Washington, D.C.
- 2002 Alabama Fisheries Association meeting, Gulf Shores, Alabama.
- 2002 US Aquaculture Association meeting, San Diego, California.
- 2001 North American Echinoderm Conference, Darling Marine Center, Maine.
- 2001 World Aquaculture Society, Orlando, Florida.
- 2001 Society for Integrated and Comparative Biology, Chicago, Illinois.
- 2000 Echinoderm Aquaculture Workshop, Oristano, Sardinia, Italy.
- 2000 Society for Integrated and Comparative Biology, Atlanta, Georgia.
- 2000 Alabama Academy of Science, Birmingham, Alabama.
- 1999 Society for Integrated and Comparative Biology, Denver, Colorado.
- 1999 Alabama Academy of Science, Athens, Alabama.
- 1999 Aquaculture America, Tampa Bay, Florida.
- 1999 Fifth International Congress of Comparative Physiology and Biochemistry, Calgary, Alberta, Canada.
- 1998 Alabama Academy of Science, Montgomery, Alabama.
- 1997 World Aquaculture Society, Seattle, Washington.
- 1997 Society of Integrated and Comparative Biology, Albuquerque, New Mexico.

## PROFESSIONAL MEETINGS ATTENDED (CONT.)

- 1996 Alabama Academy of Science, Tuskegee, Alabama.
- 1996 Aquaculture America, Dallas, Texas.
- 1996 International Association of Astacology, Thunder Bay, Ontario, Canada.
- 1996 American Society of Zoologists, Washington D.C.
- 1995 Mississippi Academy of Science, Biloxi, Mississippi

## RELEVANT EXPERIENCE

- More than 20 years experience in fish and invertebrate closed system culture.
- 12 years experience in pond culture of fish and crustaceans
- Closed systems design and construction.
- Aquaculture consulting and outreach.
- Experience in 4-yr, 2-yr, and K12 aquaculture instruction.
- Aquaculture course and curriculum design.
- Management of fish/invertebrate pond culture.
- Grant writing, submission, management, completion.
- Transportation of live fish and crustaceans.
- Identification and treatment of aquaculture pathogens.
- Proficient in protein gel electrophoresis (IEF, SDS, 2D).
- Proficient in water chemistry analysis.
- Proficient in spectrophotometry.
- Certified SCUBA and drysuit diver.
- Proficient with Microsoft Office, Systat and Sigmaplot software.

**-Species:** *Lytechinus variegatus*, *Procambarus clarkii*, *Macrobrachium rosenbergii*, *Litopenaeus vannemei*, *Oreochromis niloticus*, *Ictalurus punctatus*, *Cryprinus carpio (koi)*, *Oncorhynchus mykiss*, *Poecillia reticulata*, *Morone saxatilis*, *Perca Flavescens*, *Danio rerio*

## REFERENCES

Dr. Stephen A. Watts, Professor and Graduate Program Director, Department of Biology, University of Alabama at Birmingham, 1300 University Blvd., Birmingham, AL 35994-1170, 205-934-2045, sawatts@uab.edu

Dr. Addison Lawrence, Professor Shrimp Nutrition, Texas A&M Shrimp Mariculture Research, Texas Agriculture Experiment Station, Port Aransas, TX, 78373, 326-749-4625 Ext. 230, lmciall@ispwest.com

## REFERENCES (CONT.)

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Dave Cline, Extension Aquaculturist, Alabama Cooperative Extension Service, Auburn University, Department of Fisheries and Allied Aquaculture, 203-B Swingle Hall, Auburn, AL 36849-5419, 334-844-2874, dcline@aces.edu

Dr. Jim Jolly, Dean of Academics, Gadsden State Community College, P. O. Box 227, Gadsden, AL 35902, 256-549-8256, jjolly@gadsdenstate.edu

Dr. Ken Marion, Biology Department Chairman, Department of Biology, University of Alabama at Birmingham, 1300 University Blvd., Birmingham, AL 35994-1170, 205-934-4290, kmarion@uab.edu

Dr. Louis R. D'Abramo, Professor/Aquaculture Biologist, Associate Director Mississippi Alabama Seagrass Consortium, Mississippi State University, Department of Wildlife and Freshwater Fisheries, Box 9690, Mississippi State, MS 39762, 662-325-7492, LDAbramo@CFR.MsState.Edu

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