
Bryan W. Clark, M.S., Ph.D.

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EDUCATION

Ph.D. Environment, Sept 2010, Integrated Toxicology and Environmental Health Program/Nicholas School of the Environment, Duke University, Durham, NC
Dissertation: Molecular mechanisms underlying adaptation to PAHs in *Fundulus heteroclitus*
Committee: Richard Di Giulio (advisor), David Hinton, Joel Meyer, Heather Stapleton

M.S. Toxicology, 2004, Interdepartmental Toxicology Program/Department of Entomology, Iowa State University, Ames, IA
Thesis: The environmental fate and effects of *Bacillus thuringiensis* (Bt) proteins in soil.
Committee: Joel R. Coats (advisor), Gary Atchison, Richard Hellmich

B.S. Chemistry, 2001, with Distinction, Iowa State University, Ames, IA

PROFESSIONAL EXPERIENCE

Research

- Postdoctoral Research Associate, Ecotoxicology Laboratory of Dr. Richard Di Giulio, Nicholas School of the Environment, Duke University, 8/2010-present
- National Institute of Environmental Health Training Fellow, Ecotoxicology Laboratory of Dr. Richard Di Giulio, Nicholas School of the Environment, Duke University, 2005-2010
- Rotating student, laboratory of Dr. David Hinton and Dr. Seth Kullman, Nicholas School of the Environment, Duke University, 1/2006-5/2006
- Research Associate, Pesticide Toxicology Laboratory of Dr. Joel Coats, Dept. of Entomology, Iowa State University, 12/2004-7/2005
- Graduate Research Assistant, Dept. of Entomology and Interdepartmental Toxicology Program, Iowa State University, Major Advisor: Dr. Joel Coats, 2001-2004
- Lab Technician, Pesticide Toxicology Laboratory of Dr. Joel Coats, Dept. of Entomology, Iowa State University, 2000-2001
- Undergrad Researcher, laboratory of Dr. William Jenks, Chemistry Dept., Iowa State University, 2000
- Lab Technician, Biological Control Laboratory of Dr. John Obrycki, Dept. of Entomology, Iowa State University, 1995-1999

Teaching

Duke University

- Guest lecturer, Environmental Toxicology (ENV 212), 2010
- Instructor, Environmental Toxicology (ENV 212), 2009
- Teaching Assistant, Intro to Environmental Science and Policy (ENV 25), F 2008, S 2009
- Teaching Assistant, Mechanisms in Environmental Toxicology (ENV 319), 2008
- Teaching Assistant, Environmental Toxicology (ENV 212), 2007

Iowa State University

- Lecturer, Pesticides in the Environment (ENT/TOX 550), 2004
- Course Designer/Lecturer, Short Course on Pesticide Analysis, 2004
- Lab Instructor, Toxicology Methods (TOX 502), 2004
- Teaching Assistant, General Chemistry for Majors (CHEM 177), 2003
- Teaching Assistant, General Chemistry for Engineers (CHEM 167), 1998-2000

PUBLICATIONS

- Clark, BW**, CW Matson, D Jung, and RT Di Giulio. 2010. AHR2 mediates cardiac teratogenesis of polycyclic aromatic hydrocarbons and PCB-126 in Atlantic killifish (*Fundulus heteroclitus*). *Aquatic Toxicology*, 99:232-240.
- Noyes P, M McElwee, H Miller, **B Clark**, L Van Tiem, K Walcott, K Erwin, and E Levin. 2009. The Toxicology of Climate Change: Environmental Contaminants in a Warming World. *Environment International*, 35(6):971-986.
- Matson, CW, **BW Clark**, MJ Jenny, CR Fleming, ME Hahn, and RT Di Giulio. 2008. Development of the morpholino gene knockdown technique in *Fundulus heteroclitus*: A tool for studying molecular mechanisms in an established environmental model. *Aquatic Toxicology*, 87(4):289-295.
- Clark, BW**, KR Prihoda, and JR Coats. 2006. Subacute effects of transgenic Cry1Ab *Bacillus thuringiensis* corn litter on the isopods *Trachelipus rathkii* and *Armadillidium nasatum*. *Environmental Toxicology and Chemistry*, 25(10):2653-2661.
- Clark, BW** and JR Coats. 2006. Subacute effects of Bt Cry1Ab corn litter on the earthworm *Eisenia fetida* and the springtail *Folsomia candida*. *Environmental Entomology*, 35(4):1121-1129.
- Clark, BW**, TA Phillips, and JR Coats. 2005. The environmental fate and effects of Bt (*Bacillus thuringiensis*) proteins: A review. *Journal of Agricultural and Food Chemistry*, 53(12):4643-4653.
- Belden, JB, TA Phillips, **BW Clark**, and JR Coats. 2005. Toxicity of pendimethalin to nontarget soil organisms. *Bulletin of Environmental Contamination*, 74(4):769-76.
- Belden, JB, **BW Clark**, TA Phillips, KL Henderson, and JR Coats. 2004. Detoxification of pesticide residues in soil using phytoremediation, Chapter 12, pp. 155-167. In *Pesticide Decontamination and Detoxification*. J.J. Gan, P.C. Zhu, S.D. Aust, and A.T. Lemley (eds.), American Chemical Society, Washington, D.C.

Belden, JB, TA Phillips, KL Henderson, **BW Clark**, MJ Lydy, JR Coats. 2002. Persistence, mobility, and bioavailability of pendimethalin and trifluralin in soil, Chapter 10, pp. 167-177. In *Environmental Fate and Effects of Pesticides*. J.R. Coats and H. Yamamoto (eds.), American Chemical Society, Washington, D.C.

In preparation

Clark, BW, EM Cooper, H Stapleton, and RT Di Giulio. 2011. Varied resistance to polycyclic aromatic hydrocarbons and PCB-126 among Atlantic killifish (*Fundulus heteroclitus*) subpopulations throughout the Elizabeth River estuary (Virginia, USA).

Clark, BW, RT Di Giulio. 2011. Atlantic killifish (*Fundulus heteroclitus*) adapted to polycyclic aromatic hydrocarbons are cross-resistant to multiple insecticides.

Clark, BW, AJ Bone, RT Di Giulio. 2011. Heritable changes in CYP1 activity and mRNA expression associated with resistance to aryl hydrocarbon-induced teratogenesis in *Fundulus heteroclitus* embryos

Clark, BW, RT Di Giulio. 2011. The Elizabeth River Story: A case study in evolutionary toxicology.

Miller, HD, **BW Clark**, DC Volz, DE Hinton, and SW Kullman. 2011. 17 α -ethinylestradiol induced gene expression changes are linked to testicular pathogenesis and reproductive impairment in the medakafish (*Oryzias latipes*).

AWARDS AND SCHOLARSHIPS

- James B. Duke Fellowship, Duke University, 2005-2009
- Best Student Poster Award, Superfund Basic Research Program National Meeting, Durham, NC, 2007
- Graduate Student Travel Award – Nicholas School of the Environment, 2009
- Graduate Student Travel Award – Duke University Graduate School, 2009
- Travel Award (PhD level), SETAC, 2008
- Research Excellence Award – given to top 10% of graduate researchers, Iowa State University, 2004
- 1st place, Best Student Poster, Ozark-Prairie Region, SETAC, 2003
- 2nd place, Best Student Poster, Ozark-Prairie Region, SETAC, 2002
- Travel Award (Masters level), SETAC, 2002
- American Chemical Society (Agrochemical Division) Travel Award, 2002, 2003, 2004
- Travel Award (Undergraduate level), SETAC, 2001
- Dow-Goetz Scholarship, Iowa State University Chemistry Department, 1997-2001
- Chemistry Undergraduate Academic Achievement Award, 1st 1998-2000, 2nd 2001
- Felton Memorial Scholarship, Iowa State University Chemistry Department, 1999

SELECTED PRESENTATIONS*Oral Presentations*

- Clark, B.W.**, E. Cooper, R.T. Di Giulio. 2009. Compound- and mixture-specific resistance to PAHs in *Fundulus heteroclitus* subpopulations throughout the Elizabeth River estuary (Virginia, USA). 30th Annual Meeting in North America of the Society of Environmental Toxicology and Chemistry, New Orleans, LA.
- Clark, B.W.**, C.W. Matson, D. Jung, and R.T. Di Giulio. 2009. Investigation of AHR pathway function and PAH adaptation in *Fundulus heteroclitus* using morpholino gene knockdown. 15th International Symposium on Pollutant Responses in Marine Organisms, Bordeaux, France.
- Clark, B.W.**, S. Butters, and R.T. Di Giulio. 2008. *Fundulus heteroclitus* (mummichog) adapted to PAHs are cross-resistant to multiple insecticides. 29th Annual Meeting in North America of the Society of Environmental Toxicology and Chemistry, Tampa, FL.
- Clark, B.W.**, K.R. Prihoda, and J.R. Coats. 2004. Development of subacute bioassays for the assessment of transgenic corn expressing Bt proteins. 4th World Congress of the Society of Environmental Toxicology and Chemistry, Portland, OR.
- Clark, B.W.** and J.R. Coats. 2004. Development of analytical techniques for detection and quantification of the Bt protein from corn (*Zea mays*). 228th National Meeting of the American Chemical Society, Agrochemical Residues and Metabolism Symposium, Philadelphia, PA.
- Clark, B.W.** and J.R. Coats. 2004. Development of bioassays for the analysis of Bt corn. Joint Regional Meeting of the Ozark-Prairie and Midwest Chapters of the Society of Environmental Toxicology and Chemistry, LaCrosse, WI.

Poster Presentations

- Clark, B.W.**, C.W. Matson, C.R. Fleming, M.J. Jenny, M.E. Hahn, and R.T. Di Giulio. 2008. Morpholino knockdown of CYP1A exacerbates cardiac deformities in β -naphthoflavone dosed *Fundulus heteroclitus*. 47th Annual Meeting of the Society of Toxicology.
- Clark, B.W.**, C.W. Matson, C.R. Fleming, M.J. Jenny, M.E. Hahn, and R.T. Di Giulio. 2008. Investigation of PAH adaptations in *Fundulus heteroclitus* using morpholino gene knockdown. 4th Aquatic Animal Models Meeting, Durham, NC.
- Clark, B.W.**, C.W. Matson, C.R. Fleming, M.J. Jenny, M.E. Hahn, and R.T. Di Giulio. 2007. Investigation of PAH adaptations in *Fundulus heteroclitus* using morpholino gene knockdown. Superfund Basic Research Program National Meeting, Durham, NC.
- Miller, H.D., **B.W. Clark**, D.C. Volz, D.E. Hinton, and S.W. Kullman. 2006. 17 α -ethinylestradiol induced gene expression changes and subsequent testicular pathogenesis in the medakafish (*Oryzias latipes*). 27th Annual Meeting in North America of the Society of Environmental Toxicology and Chemistry, Montreal, Canada.
- Clark, B.W.** and J.R. Coats. 2004. Development of analytical techniques for the detection and quantification of the Bt toxin from corn. 4th World Congress of the Society of Environmental Toxicology and Chemistry, Portland, OR.

Clark, B.W., T.A. Phillips, and J.R. Coats. 2002. Development of bioassays for analysis of Bt corn (*Zea mays*). 23rd Annual Meeting in North America of the Society of Environmental Toxicology and Chemistry. Salt Lake City, UT.

Clark, B.W., J.B. Belden, T.A. Phillips, and J.R. Coats. 2001. Evaluation of phytoremediation success of *Morus rubra* on pesticide-contaminated soil using biological and chemical endpoints. 22nd Annual Meeting in North America of the Society of Environmental Toxicology and Chemistry. Baltimore, MD.

TECHNICAL REPORT

Coats, J.R., T.A. Phillips, **B.W. Clark**, and J.B. Belden. Bt toxin environmental fate and effects: Annotated bibliography (<http://www.ent.iastate.edu/dept/research/tox/btlit/>). Final Report. Dow AgroSciences LLC, Global Exposure and Risk Assessment, Indianapolis, IN.

GRANT WRITING

As a graduate student and postdoctoral researcher, I have collaborated in the writing of multiple grant proposals to the U.S. EPA, USDA, regional funding programs, and industry. I was a primary author on funded proposals from the USDA and Dow AgroSciences:

Development of analytical techniques for environmental detection and quantification of the Bt toxin from transgenic corn, USDA Biotechnology Risk Assessment Research Grants Program, \$221,000

Development of analytical techniques for the determination of Bt Cry IF endotoxin in soil, Dow AgroSciences LLC, \$11,340

PROFESSIONAL ASSOCIATIONS & SERVICE

- Society of Environmental Toxicology and Chemistry (SETAC), 2001-present
- American Chemical Society (ACS), Agrochemicals Division, 2002-2006
- Sigma Xi, inducted Spring 2005
- Nicholas School of the Environment Technical Advisory Committee, 2008-present