CURRICULUM VITAE OF
STEPHEN D. EBBS

I. PROFESSIONAL AFFILIATION

Associate Professor and Interim Chair, Department of Plant Biology
Editor in Chief for Inorganics, *International Journal of Phytoremediation*
Member, Center for Ecology
Member, Environmental Resource and Policy PhD program
2004 Outstanding Faculty Member in the Core Curriculum
2004 Chancellor's Award for Excellence in Teaching
Southern Illinois University Carbondale
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II. EDUCATION

1995-1997	Ph.D., Environmental Toxicology, Cornell University, Ithaca, NY
1990-1995	M.S., Environmental Toxicology, Cornell University, Ithaca, NY
1986-1990	B.S., Biology, Honor's, McKendree College, Lebanon, IL

III. PROFESSIONAL EXPERIENCE

2011-	Interim Chair, Dept. of Plant Biology, Southern Illinois University Carbondale
2008-2011	Assistant Chair, Dept. of Plant Biology, Southern Illinois University Carbondale
2007, 2008	Acting Chair, Dept. of Plant Biology, Southern Illinois University Carbondale
2006	Visiting Associate Professor, Section of Plant Biology, Cornell University
2005	Visiting Associate Professor, School of Botany and School of Chemistry, The University of Melbourne, Victoria, Australia
2004-present	Associate Professor, Dept. of Plant Biology, Southern Illinois University Carbondale
2002	Visiting Assistant Professor, Dept. of Horticulture and Landscape Architecture, Purdue University, West Lafayette, IN
2001-2004	Adjunct Assistant Professor, Dept. of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA (term appointment)
1999-2004	Assistant Professor, Dept. of Plant Biology, Southern Illinois University Carbondale
1997-1999	Post-Doctoral Associate, Section of Plant Biology, Cornell University, USDA-ARS
1995-1997	Research Assistant, Section of Plant Biology, Cornell University, USDA-ARS

IV. RESEARCH AND CREATIVE ACTIVITY

Interests and Specialties

Plant physiology and physiological ecology, phytoremediaiton, phytotechnologies, environmental toxicology and biogeochemistry: Transport, fate and behavior of contaminants at the plant-soil-water interface; trophic transfer of contaminants; physiological responses of plants to environmental contaminants; mechanisms of metal hyperaccumulation and hypertolerance in plants; plant metabolism of cyanide; phytoremediation and green roof technology; gold phytomining; micronutrient density in plants.

Current Projects – Emphasis of major research projects

2012-	Mercury cycling in biosolids and prospects for phytoremedation/phytostabilization
2011-	Impact of engineered nanoparticles and automotive friction mateirals on plants; trophic transfer of nanoparticles through natural food webs and into human foods; nanoparticle-mediated accumulation of contaminants in plants
2007-	Dependence of micronutrient transport to crop seeds on plant developmental stage; mechanisms contributing to micronutrient partitioning to seeds
2006-	Influence of green roofs and green roof components on urban water quality.
2005-	Gold phytomining; Fate of gold-adjuvant complexes in soil-water systems.
2001-	Transport and metabolism of cyanide and metal cyanide complexes by plants; Cyanide assimilation by the β-cyanoalanine pathway; Contribution of cyanogenic nitrogen to plant nitrogen metabolism.
1999-	Characterization of mechanisms that contribute to heavy metal hyperaccumulation and tolerance in the hyperaccumulator *Thlaspi caerulescens*

Competitive External Grants Received

2012	USDA National Institute for Food and Agriculture, Food Safety, Accumulation of engineered nanoparticles in root vegetables and herbs: nutritional bioaccessibility and dietary exposure risks, $499,086, PI - four years
2012	Syncrude Canada, The early development of Sandhill Fen: Plant establishment, community stabilization, and ecosystem development, $1,120,093, PI - four years
2012	Australian Research Council, The pollution potential of mercury in legacy biosolids and possibilities for its minimization by phytoremediation and phytostabilization approaches, AUS$496,000, CoPI - four years
2004	National Science Foundation, Integrative Plant Biology, Intraspecific variation in *Thlaspi caerulescens*: The key to increasing metal sequestration in plants, $100,000, PI - three years
2003	Consortium for Advanced Radiation Sources (Illinois Board of Higher Education-University of Chicago), Aspects of arsenic metabolism in the hyperaccumulating brake fern *Pteris vittata*, $44,961, PI - one year
2002	USDA National Research Initiative, Intercellular metal trafficking in hyperaccumulator plants, $120,000, PI - three years
2002	Consortium for Advanced Radiation Sources (Illinois Board of Higher Education-University of Chicago), Cadmium localization and ligand coordination in the

metal hyperaccumulating plant *Thlaspi caerulescens*, $136,442, PI - one year

2001 Illinois Department of Natural Resources, Waste Management and Research Center, Metal bioaccumulation by garden vegetables grown on soil derived from Peoria Lake sediment, $13,374, PI - one year

2000 ThermoRetec-Gas Research Institute, Phytoremediation potential of willow for cyanide contaminated groundwater, $65,321, PI - three years.

Competitive Internal Grants Received

2008 Cyanide assimilation via the cyanoalanine pathway contributes to aromatic amino acid synthesis in plants, $19,621, one year.

Honors and Awards (Research)

2005 Collaborative Research Award, The University of Melbourne

Papers/Presentations at Professional Meetings (graduate students; undergraduate students)

2011 Alsup SA, **Ebbs SD**, Battaglia, LL, Retzlaff WA. Heavy metals from substrates and structural materials influence water quality of leachate from simulated green roof systems 8th Annual Meeting, International Phytotechnology Society, 13-16 September.

2011 **Ebbs S**, Zambrano MC, Kaskie M, Rhanor T, Milner M, Kochian LV. Amino acid polymorphisms in the HMA3 and NRAMP1 membrane transporters from the metal hyperaccumulating plant *Thlaspi caerulescens* confer functional differences in ion transport. 8th Annual Meeting, International Phytotechnology Society, 13-16 September.

2011 **Ebbs S**, Whankaew S, Rhanor T, Triwitayakorn K, Woodrow I, Baker A. Utilization of cyanide as a supplemental source of nitrogen by plants under nitrogen replete conditions and nitrogen starvation. Annual Meeting of the Botanical Society of America. St. Louis, Mo. 9-13 July.

2011 Koropchak S, Vitt DH, **Ebbs SE**, House MK. Sodium tolerance of *Carex aquatilis*: Applications to boreal wetland reclamation after oil sands surface mining in Northern Alberta**.** Responsible Peatland Management and Growing Media Production. Québec City, Canada, 13-17 June.

2010 **Ebbs S**, Zambrano CM, Milner M, Kochian L, Newville M. Unraveling heavy metal homeostasis in the Zn/Cd hyperaccumulator *Thlaspi caerulescens*. Annual Meeting of the Midwest Section of the American Society of Plant Biologists, Mar 27-28, West Lafayette, IN.

2010 Zambrano CM, Milner M, Kochian L, **Ebbs S**. Functional characterization of HMA3 in *Arabidopsis thaliana* compared with the Zn/Cd hyperaccumulator *Noccaea caerulesens*. Annual Meeting of the Midwest Section of the American Society of Plant Biologists, Mar 27-28, West Lafayette, IN.

2010 Machingura M, Sidibe A, **Ebbs S.** Activity of the β-cyanoalanine pathway is associated with the response to abiotic stress is *Arabidopsis thaliana*. Annual Meeting of the Midwest Section of the American Society of Plant Biologists, Mar 27-28, West Lafayette, IN.

2009 **Ebbs SD**, Milner MJ, Zambrano MC, Kochian LV. Ecotypic differences in metal hyperaccumulation in *Thlaspi caerulescens*: Searching for genes that contribute to metal hyperaccumulation and tolerance in plants. The 6th International Phytotechnologies Conference, Dec 2-4, St. Louis, MO.

2009 Alsup SA, **Ebbs SD**, Retzlaff WA. The exchangeability and leachability of metals from select green roof growth substrates. The 6th International Phytotechnologies Conference, Dec 2-4, St. Louis, MO.

2008 **Ebbs SD**. General biology labs and distance learning: A Blackboard-based multimedia approach. The 16th Annual American Association for Collegiate Independent Study Conference, Nov 6-8, St. Louis, MO.

2008 Alsup S, **Ebbs S**, Battaglia L, Woods E, Gaffney D, Forrester K, Jost V, Luckett K, and Retzlaff W. Evaluating Storm Water Quality From Select Green Roof Designs. 100th Annual Meeting of the Illinois State Academy of Science. Champaign, IL, Apr 4-5

2007 **Ebbs SD**, Sankaran RP, Talbott J. Cultivation of Garden Vegetables in Peoria Pool Sediments from the Illinois River: A Case Study in Trace Element Accumulation and Dietary Exposures. Characteristics and Reuse Potential of Illinois River Sediments. Waste Management and Research Center, Illinois Department of Natural Resources. Mar 1, Champaign, IL.

2007 **Ebbs SD**, Piccinin RCR, Reichman SM, Kolev, SD. Woodrow IE, Baker AJM. A screen of some native Australian flora and exotic agricultural species for their potential application in cyanide-induced phytoextraction of gold. The 4th International Phytotechnologies Conference, Sep 24-26, Denver, CO.

2007 **Ebbs SD**, Milner M, Spiller S, Kochian L. Unraveling heavy metal homeostasis in the Zn/Cd hyperaccumulator *Thlaspi caerulescens*: membrane transport and microarray studies. Annual Meeting of the Botanical Society of America. Jul 7-11. Chicago, IL.

2007 **Ebbs SD**, Kosma D, Piccinin R, Nielson E, Woodrow IE. Cyanide at sub-toxic levels is perceived as a source of nitrogen by plants. Annual Meeting of the Botanical Society of America. Jul 7-11. Chicago, IL.

2006 **Ebbs SD**, Piccinin RCR, Reichman SM, Kolev, SD. Woodrow IE, Baker AJM. Phytoremediation of cyanide by cyanogenic plants. The Sixteenth Annual AEHS Meeting and West Coast Conference on Soils, Sediments, and Water. Mar 13-16. San Diego, CA.

2005 Nagarajan V and **Ebbs SD**. Mechanism of arsenite uptake by arsenic hyperaccumulating ferns. The 3rd International Phytotechnologies Conference. Apr 20-22. Atlanta, GA.

2005 Kosma D and **Ebbs SD**. Contribution of the β-cyanoalanine pathway to cyanide assimilation and plant nitrogen metabolism. The 3rd International Phytotechnologies Conference. Apr 20-22. Atlanta, GA.

2005 **Ebbs SD**, Ghosh R, Bushey JT, Dzombak DA. Cyanide phytoremediation: removal from and fate in soil-water-plant systems. The 3rd International Phytotechnologies Conference Apr 20-22. Atlanta, GA.

2004 Nagarajan VK, **Ebbs SD**. Transport and reduction of arsenic in arsenic hyperaccumulating ferns. 68th Annual Meeting of the American Society of Agronomy-Soil Science Society of America-Crop Science Society of America Oct 31-Nov 4. Seattle, WA.

2003 **Ebbs SD**. Transport and metabolism of cyanogenic compounds by roots of willow (*Salix eriocephala*). The Second Annual Midwest Rhizosphere Research Symposium, The Donald Danforth Plant Science Center. Sep 19-20. St. Louis, MO.

2003 **Ebbs SD**. *In vivo* speciation of arsenic in the arsenic-hyperaccumulating brake fern *Pteris vittata*. Annual Meeting of the American Society of Agronomy. Nov 2-6. Denver, CO.

2002 **Ebbs SD**, Bushey J, Dzombak D. Phytoremediation of iron cyanide complexes in soil-water systems. 67th Annual Meeting of the American Society of Agronomy-Soil Science Society of America-Crop Science Society of America. Nov 10-14. Indianapolis, IN.

2002 **Ebbs SD**, Bushey J, Dzombak D. Phytoremediation of Complexed Metal Cyanides in Soil-Water Systems. 12th Annual West Coast Conference on Contaminated Soils, Sediments, and Water, Association for Environmental Health and Sciences. Mar 18-21. San Diego, CA.

2000 **Ebbs SD**, Lau I, Ahner BA, Kochian LV. Phytochelatin synthesis is not responsible for Cd tolerance in the Zn/Cd Hyperaccumulator *Thlaspi caerulescens*. Annual Meeting of the American Society of Plant Physiologists. Jul 15-19. San Diego, CA.

2000 **Ebbs SD**, Brady DJ, Norvell WA, Kochian LV. Uranium speciation, plant uptake, and phytoremediation. Convergence 2000 Environmental and Pipeline Engineering Conference. Jul 23–26. Kansas City, MO.

Invited Seminars

2012 Chicago Botanic Garden
2012 Botanical Research Institute of Texas
2005 University of Illinois Urbana-Champaign
2004 Syracuse University
2002 University of Illinois at Chicago
2001 IACR-Rothamsted
2000 Illinois Department of Natural Resources Waste Management Research Center

V. PUBLICATIONS/CREATIVE WORKS (**graduate students**; **undergraduate students**)

Articles in Professional Journals

Submitted, Reviewed, and In Preparation Articles

50. Machingura M, **Ebbs SD**. The β-cyanoalanine synthase pathway: Contributing more to metabolism than cyanide detoxification. *Journal of Experimental Botany*. In preparation.
49. McElyea M, Ebbs SD, Gibson, DJ, Filip P. Influence of automotive brake dust on the growth and elongation of lettuce (*Lactuca sativa*) and wheat (*Triticum aestivum*) roots. In preparation.
48. Machingura M, **Ebbs SD**. Metabolic redundancies in the β-cyanoalanine synthase pathway: Implications for cyanide assimilation and tolerance. In preparation.
47. Ebbs SD, Shupert LA, Lawrence J, Gibson DJ, Filip P. Effects of dissolved automotive brake dust solution on growth and metal sequestration in the aquatic fern *Salvinia molesta*. *Science of the Total Environment*. In preparation.
46. Whankaew S, Machingura M, Rhanor T, Triwitayakorn K, **Ebbs SD**. Influence of cyanide on biomass, relative growth rate, and nitrogen content of shoots of wheat (*Triticum aestivum*) and sorghum (*Sorghum bicolor*). Under revision following review.

45. Ramesar NS, Tavarez M, **Ebbs SD**, Sankaran RP. Transport and accumulation of lead in Indian mustard *(Brassica juncea)* and wheat *(Triticum aestivum*). Under revision following review
44. Machingura M, Sidibe, A, Wood AJ, **Ebbs SD**. The β-cyanoalanine pathway is involved in the response to water deficit in *Arabidopsis thaliana*. Under revision following review.

Published, In Press, and Accepted Peer-reviewed Articles

43. Alsup SE, **Ebbs SD**, Battaglia LL. and Retzlaff WA. 2011. Green roof systems as sources or sinks influencing heavy metal concentrations in runoff. *Journal of Environment Engineering*, In press.
42. **Ebbs SD**, Kolev SD, Piccinin RCR, Woodrow IE, Baker AJM. 2011. Initial loss of cyanide, thiocyanate, and thiosulfate adjuvants following amendment to an oxidic gold ore. *Minerals Engineering*. 24:1641-1643.
41. Alsup SE, **Ebbs SD**, Battaglia LL. and Retzlaff WA. 2011. Heavy metals in leachate from simulated green roof systems. *Ecological Engineering*. 37:1709-1717.
40. Ueno D, Milner MJ, Yamaji N, Yokosho K, Koyama E, Zambrano MC, Kaskie M, Ebbs **S**, Kochian LV, Ma JF. 2011. Elevated expression of TcHMA3 plays a key role in the extreme Cd tolerance in a Cd-hyperaccumulating ecotype of *Thlaspi caerulescens*. *The Plant Journal* 66: 852-862
39. Millar KDL, **Ebbs SD**, Gibson DJ, Wood AJ, and Young BG. 2011. Evaluation of physiological parameters for the prediction of seed yield and quality for soybean (*Glycine max*) plants grown in the presence of weed competition. *Plant Biosystems*. 15(1):1-12.
38. Machingura M, **Ebbs SD**, 2010. Increased β-cyanoalanine synthase and asparaginase activity in nitrogen-deprived wheat exposed to cyanide. *Journal of Plant Nutrition and Soil Science*. 173:808-810.
37. Nagarajan VK and **Ebbs SD**. 2010. Arsenate reductase activity in roots from the arsenic hyperaccumulator *Pteris vittata* utilizes both glutathione and dithiothreitol as reductants. *Plant Biosystems*. 14(4): 857-859.
36. **Ebbs SD**, Kolev SD, Piccinin RCR, Woodrow IE, and Baker AJM. 2010. Solubilization of heavy metals from gold ore by adjuvants used during gold phytomining. *Minerals Engineering*. 23:819-822.
35. **Ebbs SD**, Kosma DK, Nielson EH, Machingura M, Baker AJM and Woodrow IE. 2010. Nitrogen supply and cyanide concentration influence the enrichment of nitrogen from cyanide in wheat (*Triticum aestivum* L.) and sorghum (*Sorghum bicolor* L.). *Plant, Cell & Environment*. 33:1152-1160.
34. Alsup S, **Ebbs S** and Retzlaff W. 2010. The exchangeability and leachability of metals from select green roof growth substrates. *Urban Ecosystems*. 14:91-111.
33. **Ebbs S**, Hatfield S, Nagarajan V and Blaylock M. 2010. A comparison of the dietary arsenic exposures from ingestion of contaminated soil and hyperaccumulating *Pteris* ferns used in a residential phytoremediation project. *International Journal of Phytoremediation* 12(1):121-132.
32. **Ebbs SD**, Zambrano MC, Spiller SM and Newville M. 2009. Cadmium sorption, influx, and efflux at the mesophyll layer of leaves from ecotypes of the Zn/Cd hyperaccumulator *Thlaspi caerulescens*. *New Phytologist* 181(3):626 - 636.

31. **Ebbs S** and Uchil S. 2008. Cadmium and zinc induced chlorosis in Indian mustard [*Brassica juncea* (L.) Czern] involves preferential loss of chlorophyll *b*. *Photosynthetica* 46(1):49-55.
30. **Ebbs SD**, Piccinin RCR, Goodger JQD, Kolev SD, Woodrow IE and Baker AJM. 2008. Transport of ferrocyanide by two eucalypt species and sorghum. *International Journal of Phytoremediation* 10(4):343-357.
29. Sankaran RP and **Ebbs SD**. 2008. Transport of Cd and Zn to seeds of Indian mustard (*Brassica juncea* L. Czern.) during specific stages of plant growth and development. *Physiologia Plantarum* 132:69-78.
28. Nagarajan VK and **Ebbs SD**. 2007. Transport of arsenite by the arsenic hyperaccumulating brake fern *Pteris vittata* is inhibited by monovalent silver. *Indian Journal of Plant Physiology* 12(4):312-316.
27. Piccinin RCR, **Ebbs SD**, Reichman SM, Kolev SD, Woodrow IE and Baker AJM. 2007. A screen of some native Australian flora and exotic agricultural species for their potential application in cyanide-induced phytoextraction of gold. *Minerals Engineering* 20:1327–1330.
26. Sankaran RP and **Ebbs SD**. 2007. Cadmium accumulation in deer tongue grass (*Panicum clandestinum* L.) and potential for trophic transfer to microtine rodents. *Environmental Pollution* 148(2):580-589.
25. Alwerdt JA, Gibson DJ, **Ebbs SD** and Wood AJ. 2006. Intraspecific interactions in *Arabidopsis thaliana* and the stomatal mutants *tmm1-1* and *sdd1-2*. *Biologia Plantarum* 50(2):205-209.
24. Bushey JT, **Ebbs SD** and Dzombak DA. 2006. Development of a plant uptake model for cyanide. *International Journal of Phytoremediation* 8(1):25-43.
23. Bushey JT, Small MJ, Dzombak DA and **Ebbs SD**. 2006. Parameter estimation of a plant uptake model for cyanide: Application to hydroponic data. *International Journal of Phytoremediation* 8(1):45-62.
22. Corbit RM, **Ebbs SD**, King ML and Murphy LL. 2006. The influence of lead and arsenite on the inhibition of human breast cancer MCF-7 cell proliferation by American ginseng root (*Panax quinquefolius* L.). *Life Sciences* 78:1336–1340.
21. **Ebbs SD**, Talbott J and Sankaran R. 2006. Cultivation of garden vegetables in Peoria pool sediments from the Illinois River: A case study in trace element accumulation and dietary exposures. *Environment International* 32(6):766-774.
20. Corbit R, Ferreira J, **Ebbs S** and Murphy L. 2005. Simplified extraction of ginsenosides from American ginseng (*Panax quinquefolius* L.) for high-performance liquid chromatography-ultraviolet analysis. *Journal of Agricultural and Food Chemistry* 53:9867-9873.
19. Liu X, Qitang W, **Ebbs S** and Banks MK. 2005. Phytoextraction of Zn and Cu from sewage sludge and impact on agronomic characteristics. *Journal of Environmental Science and Health, Part A* 40(4):823-838.
18. Kosma DK, Long JA and **Ebbs SD**. 2004. Cadmium bioaccumulation in yellow foxtail (*Setaria glauca* L. P. Beauv.): Impact on seed head morphology. *American Journal of Undergraduate Research* 3:9-14.
17. Bushey JT, **Ebbs SD** and Dzombak DA. 2004. Plant tissue extraction method for complexed and free cyanide. *Water, Air, and Soil Pollution* 157(1-4):281-293.
16. **Ebbs SD**. 2004. Biological degradation of cyanide compounds. *Current Opinion in Biotechnology* 15(3):231-236.

15. Samiotakis M and **Ebbs SD**. 2004. Possible evidence for transport of an iron cyanide complex by plants. *Environmental Pollution* 127:169-173.
14.‡ **Ebbs SD**, Bushey J, Poston S, Kosma D, Samiotakis M and Dzombak D. 2003. Transport and metabolism of free cyanide and iron cyanide complexes by willow. *Plant, Cell, and Environment* 26(9):1467-1478.
13. Fuhrmann M, Lasat MM, **Ebbs SD**, Cornish J and Kochian LV. 2003. Uptake and release of ^{137}Cs by five plant species as influenced by soil amendments in field experiments. *Journal of Environmental Quality* 32:2272-2279.
12. **Ebbs S**, Lau I, Ahner B and Kochian L. 2002. Phytochelatin synthesis is not responsible for Cd tolerance in the Zn/Cd hyperaccumulator *Thlaspi caerulescens* (J. & C. Presl). *Planta* 214(4):635-640.
11. Fuhrmann M, Lasat MM, **Ebbs SD**, Kochian LV and Cornish J. 2002. Uptake of cesium-137 and strontium-90 from contaminated soil by three plant species: Application to phytoremediation. *Journal of Environmental Quality* 31:904-909.
10. **Ebbs SD**, Brady DJ, Norvell WA and Kochian LV. 2001. Uranium speciation, plant uptake, and phytoremediation. *Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management* 5:130-135.
9. **Ebbs SD** and Weinstein LH. 2001. Alteration of selenium transport and volatilization in barley (*Hordeum vulgare* L.) by arsenic. *Journal of Plant Physiology* 158:1231-1233.
8. Lasat MM, Pence NS, Garvin DF, **Ebbs SD** and Kochian LV. 2000. Molecular physiology of zinc transport in the Zn hyperaccumulator *Thlaspi caerulescens*. *Journal of Experimental Botany* 51(342):71-79.
7. Pence NS, Larsen PB, **Ebbs SD**, Letham DLD, Lasat MM, Garvin DF, Eide D and Kochian LV. 2000. The molecular physiology of heavy metal transport in the Zn/Cd hyperaccumulator *Thlaspi caerulescens*. *Proceedings of the National Academy of Science of the United States of America* 97(9):4956-4960.
6. **Ebbs SD**, Brady DJ and Kochian LV. 1998. Role of uranium speciation in the uptake and translocation of uranium by plants. *Journal of Experimental Botany* 49(324):1183-1190.
5. **Ebbs SD** and Kochian LV. 1998. Phytoextraction of zinc by oat (*Avena sativa*), barley (*Hordeum vulgare*), and Indian mustard (*Brassica juncea*). *Environmental Science & Technology* 32(6):802-806.
4. **Ebbs SD**, Norvell WA and Kochian LV. 1998. The effect of acidification and chelating agents on the solubilization of uranium from contaminated soil. *Journal of Environmental Quality* 27:1486-1494.
3. Lasat MM, Fuhrmann M, **Ebbs SD**, Cornish JE and Kochian LV. 1998. Phytoremediation of a radiocesium-contaminated soil: Evaluation of cesium-137 bioaccumulation in the shoots of three plant species. *Journal of Environmental Quality* 27(1):165-169.
2. **Ebbs SD** and Kochian LV. 1997. Toxicity of zinc and copper to Brassica species: Implications for phytoremediation. *Journal of Environmental Quality* 26(3):776-781.
1. **Ebbs SD**, Lasat MM, Brady DJ, Cornish J, Gordon R and Kochian LV. 1997. Phytoextraction of cadmium and zinc from a contaminated soil. *Journal of Environmental Quality* 26(5):1424-1430.

‡ This article appeared on the cover the indicated issue of *Plant, Cell, and Environment*.

Published Abstracts and Proceedings (*Peer-reviewed)

6.* Retzlaff W, **Ebbs S**, Alsup S, Woods E, Jost V, Luckett K. 2008. What is that running off of my green roof? Proceedings Sixth Annual Greening Rooftops for Sustainable Communities Conference, Awards, and Trade Show. April 30 – May 2, Baltimore, MD.

5. **Ebbs SD**, Bushey JT, Dzombak DA. 2002. Phytoremediation of Iron Cyanide Complexes in Soil-Water Systems. *Soil and Sediment Contamination*. 11:458.

4. Bushey JT, **Ebbs SD**, Dzombak DA. 2002. Phytoremediation of Ferro- and potassium cyanide in groundwater with willows. *In* Proceedings of the Symposium on Remediation of Soils and Groundwater, WEFTEC 2002. Water Environment Federation, Alexandria, VA.

3. **Ebbs SD**, Norvell WA, Kochian LV. 1997. Increasing the phytoextraction of Zn and U through the application of soil amendments to contaminated soil. *In* HE Flores, *et al.* eds. Radical Biology: Advances and Perspectives on the Function of Plant Roots. American Society of Plant Physiologists: Rockville, MD. pp. 491-493.

2. Lasat MM, Brady DJ, **Ebbs SD** and Kochian LV. 1995. Screening for plants to phytoremediate heavy metal-contaminated and radionuclide-contaminated soils. *Plant Physiology* 108(2):94.

1.* **Ebbs, SD**. 1990. Patterns of sexual dimorphism in a population of house sparrows (*Passer domesticus*). *The Sigma Zetan*. 56:58-64.

Creative Contributions and Other Publications (* Peer-reviewed)

4.* Retzlaff W, Morgan S, **Ebbs S**, Celik A. 2011. Digging into green. *Professional Roofing*. October: 30-36.

3. **Ebbs SD**. 2008. Study Guide and Laboratory Manual for General Biology Online, Southern Illinois University Carbondale. 110pp.

2. **Ebbs SD**. 2008. PowerPoint Lecture Outlines to accompany Hopkins, WG and Hüner NPA. *Plant Physiology*, 4th ed. J.P. Wiley and Sons: Hoboken, NJ.

1. **Ebbs SD**. 2007. PowerPoint Lecture Outlines to accompany Mader, SS. *Essentials of Biology*. McGraw-Hill: Dubuque, IA.

Chapters in Professional Books

7. **Ebbs SD**, Bushey JT, Bond BS, Ghosh RS, and Dzombak DA. 2005. *Cyanide phytoremediation*, in *Cyanide in Water and Soil: Chemistry, Risk, and Management*, D.A. Dzombak, R.S. Ghosh, and G.W. Wong-Chong, Editors. CRC Press: Boca Raton, FL. p. 479-500.

6. **Ebbs SD**, Wong-Chong GM, Bond BS, Bushey JT, and Neuhauser EF. 2005. *Biological transformation of cyanide in water and soil*, in *Cyanide in Water and Soil: Chemistry, Risk, and Management*, D.A. Dzombak, R.S. Ghosh, and G.W. Wong-Chong, Editors. CRC Press: Boca Raton, FL. p. 93-122.

5. Ghosh RS, **Ebbs SD**, Bushey JT, Neuhauser EF, and Wong-Chong GM. 2005. *Cyanide cycle in nature*, in *Cyanide in Water and Soil: Chemistry, Risk, and Management*, D.A. Dzombak, R.S. Ghosh, and G.W. Wong-Chong, Editors. CRC Press: Boca Raton, FL. p. 225-236.

4. Wong-Chong GM, Ghosh RS, Bushey JT, **Ebbs SD**, and Neuhauser EF. 2005. *Natural sources of cyanide,* in *Cyanide in Water and Soil: Chemistry, Risk, and Management*, D.A. Dzombak, R.S. Ghosh, and G.W. Wong-Chong, Editors. CRC Press: Boca Raton, FL. p. 25-40.
3. **Ebbs SD**. 2002. *Plant tolerance mechanisms for inorganic contaminants of relevance to phytoremediation,* in *Biochemical and Molecular Responses of Plants to the Environment*, A. Wood, Editor. Research Signpost: Trivandrum, India. p. 57-68.
2. **Ebbs SD**, Kochian LV, Lasat MM, Pence NS, and Jiang T. 2000. *An integrated investigation of the phytoremediation of heavy metal and radionuclide contaminated soil: From the laboratory to the field.*, in *Bioremediation of Contaminated Soils*, D.L. Wise, D.J. Trantolo, E.J. Cichon, H.I. Inyang, and U. Stottmeister, Editors. Marcel Dekker: New York. p. 745-769.
1. **Ebbs SD**, Lasat MM, Kochian LV, Cornish J, Huddleston G, and Fuhrmann M. 1997. *Phytoremediation of radionuclide contaminated soil- Field, greenhouse, and laboratory studies*, in *Phytoremediation*, C.A. Thibeault and L.M. Savage, Editors. International Business Communications: Southborough, MA. p. 213-235.

Professional Highlights Published in Popular Press

2010 "Japanese beetle attack." WSIL-TV (6/21/10)
2007 "Testing the limits of river sediments." *Peoria Journal Star* (12/2/07).
2006 "Scientists debate the effect of global warming on the toxicity of poison ivy." *The Southern Illinoisan* (06/08/06).
2005 "Stephen Ebbs picked for project 'Down Under.'" Media & Communication Resources, Southern Illinois University Carbondale.
2001 "Safety of food supply a matter of common sense." Public Affairs, Southern Illinois University Carbondale.
2001 "Common Fern Found to Soak up Arsenic Like a Sponge." Associated Press.
2001 "Rare Plant Could Clean Up Crops." *Daily Egyptian*
2000 "Why Do Leaves Change Color in the Fall." KFVS-TV.

VI. TEACHING EXPERIENCE

Teaching Interests and Specialties

Current Courses [Departmental Listing and Number] – Years taught
Cell Biology Online [BIOL 306], 2010-present
General Biology [PLB 115], 2002-2012
General Biology [ZOOL 115], 2004, 2008, 2009, 2011 (summer session)
General Biology Online [PLB/ZOOL 115], 2008-present
Plant and Society [PLB 117], 2006-2011 (summer session)
Elements of Plant Physiology [PLB 320], 2000-present
Mineral Nutrition and Membrane Phenomena [PLB 425], 2004, 2006, 2008
Environmental Physiology of Plants [PLB 425], 2012
Advanced Cell Biology Techniques [PLB 525D], 2002-present (individualized instruction)

Plant Ecophysiology [PLB 530], 2003, 2005, 2009, 2011
Seminar in Plant Biology-Physiology [PLB 589c], 2001-2003, 2004, 2005, 2007, 2009

Past Courses Taught
Cell Biology [BIOL 306], 2001 (team taught)
General Botany [PLB 200], 2000, 2001 (team taught spring 2001)
Senior Seminar [PLB 480], 2002 (team taught)
Introduction to Research [PLB 590], 2003 (team taught)

Past Laboratories Taught as a Teaching Assistant
Biological Sciences [BIOG 1101-1104, Cornell University], 1990-1995
Introductory Biology, Individual Instruction [BIOG 1105-1106, Cornell University], 1995
Biological Sciences [BIOG 1107-1108, Cornell University], 1991-1994

Honors and Awards (Teaching)

2011 Course Developer Award, Association for Distance Education & Individualized Learning
2006 Excellence Through Commitment Undergraduate Teaching Enhancement Award, Southern Illinois University
2004 Outstanding Faculty Member in the Core Curriculum, Southern Illinois University
2004 Chancellor's Commitment to Excellence in Teaching, Southern Illinois University
2000 Wisconsin Fast Plants Workshop Fellowship, American Society of Plant Physiologists

Master's and Ph.D. Committees Served

Current Graduate Students

Machingura, M	Plant Biology	PhD
Kumar, P	Plant Biology	MS
Bradfield, S	Plant Biology	MS

Other Graduate Student Committees Served

current	Blair, C	Plant Biology	M.S.
current	Bloise, R	Plant Biology	Ph.D
current	Gage, K	Plant Biology	Ph.D
current	Hayes, C	Plant Biology	Ph.D
current	Hsu, C-K	Plant Biology	Ph.D
current	Lopez Smith, R	Plant Biology	Ph.D
current	Krings, B	Plant Biology	Ph.D
2012	Mansouri, K	Plant Biology	Ph.D
2010	Koropchak, S	Plant Biology	M.S.
2010	Yuan, J	Plant Biology	Ph.D
2008	Lambert, A	Plant Biology	M.S.
2008	Lopez Smith, R	Plant Biology	M.S.
2008	Millar, K	Plant Biology	Ph.D
2008	Peng, A	Plant Biology	M.S.
2007	Sharma, A	Plant & Soil Science	M.S.
2007	Yesudas, C	Plant Biology	M.S.

2006	Long, A	Plant Biology	M.S.
2005	Kurtural, K	Plant Biology	M.S.
2005	Schulz, J	Plant Biology	Ph.D
2004	Kahn, S	Biological Sciences	M.S.
2004	Massa, D	Plant & Soil Science	M.S.
2003	Kassem, MA	Plant Biology	Ph.D
2003	West, T	Plant Biology	Ph.D
2002	Triwitayakorn, K	Plant Biology	Ph.D
2001	Schou, C	Plant Biology	M.S.
2001	Self, S	Plant Biology	M.S.

Students Who Have Completed Degree Programs under My Direction (current position)

2012	Zambrano, MC	Plant Biology (Post-doctoral Fellow, USDA-ARS)	Ph.D
2008	Sidibe, A	Plant Biology (Working from home/materinity)	M.S.
2008	Alsup, S	Plant Biology (Public school teacher)	M.S.
2005	Sankaran, R	Plant Biology, co-supervisor, Dr. AJ Wood (Assistant Professor, Lehman College)	Ph.D
2005	Kosma, D	Plant Biology (Post-doctoral fellow, Michigan State University)	M.S.
2005	Nagarajan, V	Plant Biology (Post-doctoral fellow, University of Delaware)	M.S.
2004	Corbit, R	Plant Biology (Instructor, Shawnee Community College)	M.S.
2004	Uchil, S	Plant Biology (Monsanto, St. Louis, MO)	M.S.
2003	Bushey, J	Civil & Environmental Engineering, Carnegie Mellon University, co-supervisor, DA Dzombak (Assistant Professor, University of Connecticut)	Ph.D.
2002	Bond, B	Biological Sciences (Post-doctoral fellow, University of Missouri)	M.S.
2002	Samiotakis, M	Plant Biology (Geno-Type Biotechnology, Athens, Greece)	M.S.

Post-Doctoral Fellows

2004-2005 Krasnyanski, S.

Research Fellows

2009-2010	Whankaew, S	Royal Golden Jubileee Fellow, Mahidol Univ., Thailand
2008	Sidibe, A	Fulbright Scholar

Undergraduate Student Mentoring and Training

2012-2013	Kaszynski, K	Provided undergraduate research experience;

		Undergraduate assistantship recipient
2011-2012	Settlemoir, A	Provided undergraduate research experience; Undergraduate assistantship recipient
2011, 2012-2013	Medina, D	Provided undergraduate research experience
2010-2011	Rhanor, T	Provided undergraduate research experience; Undergraduate assistantship recipient
2010	Leffelman, C	Provided undergraduate research experience
2010	Lawrence, J	Provided undergraduate research experience
2010	Ackerman, S	Provided undergraduate research experience
2009-2010	Williams, J	Provided undergraduate research experience; Undergraduate assistantship recipient
2009	Concepcion, D	Provided undergraduate research experience
2009	Kuppart, N	Provided undergraduate research experience
2008-2009	Kaskie, M	Provided undergraduate research experience; Undergraduate assistantship recipient
2007	Grimes, G	Provided undergraduate research experience; Undergraduate assistantship recipient
2006	Hatfield, S	Provided undergraduate research experience; Undergraduate assistantship recipient
2005-2006	Blackwell, D	Undergraduate assistantship recipient
2003	Alsup, S	Provided undergraduate research experience
2003	Spiller, S	Provided undergraduate research experience; Undergraduate assistantship recipient
2003	Millar, K	Provided undergraduate research experience
2002-2003	Toler, J	Provided undergraduate research experience
2002	Small, N	Provided undergraduate research experience
2001-2002	Kosma, D	Provided undergraduate research experience
2001	Long, A	Provided undergraduate research experience
2000-2002	Poston, S	Provided undergraduate research experience
1999-2000	Benedict, J	Provided undergraduate research experience

Recognitions earned by students supervised

2009	Machingura, M	Second place, Student posters, 6th International Phytotechnologies Conference, Dec 2-4, St. Louis, MO
2009	Machingura, M	Outstanding graduate poster, American Society of Plant Biologists Midwest Sectional Meeting
2008	Alsup, S	Sigma Xi, Grants in Aid of Research Award
2006	Spiller, S	Steck Award, Department of Plant Biology, SIUC
2005	Nagarajan, V	Ozment Award, Department of Plant Biology, SIUC
2005	Spiller, S	M.S. Fellowship, Southern Illinois University Carbondale
2004	Corbit, R	Best graduate poster, Sigma Xi Research Day, SIUC
2004	Kosma, D	Best undergraduate poster, Sigma Xi Research Day, SIUC

VII. UNIVERSITY EXPERIENCE

Department Committees and Responsibilities

2009-2011	Assistant Department Chair
2008-2010	Evaluation and Awards Committee
2007-present	Recruitment and Retention Committee
2007	Search Committee (Chair), Phytochemist
2004-2005	Curriculum Committee
2004	Search Committee, Ecosystem Ecologist
2004	Search Committee, Plant Biologist
2004	Search Committee (Chair), Phytochemist
2002-present	Safety Committee (Chair)
2001-present	Equipment Committee (Chair)
2003-present	Space Committee (Chair)
2003-2004	Planning and Advisory Committee
2001	Search Committee, Phytochemist
2000-2002	Curriculum Committee
1999-2000	Search Committee for Department Chair

Additional contributions to Department

2010	Wrote/revised text for the self-study associated with the Departmental Review
2010	Wrote/revised text for production of new departmental brochure
2008-present	Representative at SIUC Open House events
2008-present	Regional community college and high school outreach
2007	Developed a 3-yr strategic plan for recruiting undergraduate majors
2007	Developed a fund-raising plan for the department
2006	Created a new undergraduate assessment system for the department
2005-2011	Faculty Mentor, Dr. A. Anterola
2004-2008	Faculty Mentor, Dr. S. Baer

College Committees

2009-present	Life Science Task Force
2008-2010	Policy Committee
2005	Selection Committee, Outstanding Faculty Member

Additional contributions to College

2011	Co-developer of the Ecotoxicology specialization in the Biological Sciences MS program
2010	SIUC representative to the Illinois Articulation Initiatives GECC physical and Life Sciences panel
2010	SOAR presentations, College of Science
2009-2010	Presenter, College of Science Living-Learning Community (4 sessions; selected by students as best faculty presenter for 2009-2010 academic year)

2008-present	Regional community college and high school outreach
2007-2008	SOAR presentations, College of Science
2004	Usher, College of Science, Graduation Ceremony

University Service

2012-2013	Instructor Course Evaluation Redesign Team
2012	Course Substitution/Waiver Committee
2011-2012	Program Changes Review Committee
2011-2012	Faculty Senate Executive Council
2011-2012	Faculty Senate Undergraduate Education and Policy Committee Co-Chair
2011	Search Committee, Associate Provost for Academic Programs
2010	Search Committee Chair, Director, University Core Curriculum
2010-present	Distance Education Council
2010-2012	Honors Advisory Council
2009-2010	Search Committee, Dean, College of Applied Science and Arts
2007-present	Chemical Oversight Advisory Committee
2007, 2009	Faculty Marshal, SIUC Graduation ceremony
2007	SIUC delegate to the Sigma Xi National Convention
2007	Lobby Day, Springfield, IL
2006-2012	Faculty Senate
2006-2008	Faculty Seed Grant Review Committee
2005, 2007	SIUC representative to the meeting of the Board of Governors for the Consortium for Advanced Radiation Sources
2004-2012	Core Curriculum Executive Council
2004-2006	Non-Traditional Student Services Advisory Council
2004-2005	Chancellor's Faculty Excellence Concept Team
2004	Internal program review panel, Center for Excellence for Soybean Research, Teaching, and Outreach (Fall 2004)
2004	SIUC delegate to the Sigma Xi National Convention
2003	SIUC delegate to the Sigma Xi National Convention
2002, 2003	Saluki Finals Finish
2000	Poster Judge, 6th Annual SIU Molecular & Cellular Biology Symposium

VIII. PROFESSIONAL SERVICE

Current Memberships in Professional Associations

2007-present	International Phytotechnology Society (Treasurer, 2011-present)

Evaluation of Journal Manuscripts, Book Chapters and Grant Proposals

Journal Review (>160 total manuscripts reviewed; number in parentheses following the titles of moderate- to high-impact journals indicate number of manuscript reviews post-tenure)

*American Journal of Botany, Bioremediation Journal **(4)**, Bioresource Technology, Biotechnology Progress, Chemosphere **(9)**, Ecological Engineering, Ecotoxicology and*

*Environmental Safety, Environmental Pollution **(5)**, Environmental Science and Technology **(26)**, Environmental Toxicology and Chemistry, Enzyme and Microbial Technology, FEMS Microbiology Letters, Functional Plant Biology, Human and Ecological Risk Assessment, International Journal of Phytoremediation **(19)**, Journal of Environmental Engineering, Journal of Environmental Management, Journal of Environmental Quality, Journal of Hazardous Materials, Journal of Medicinal Food, Journal of Plant Physiology, Journal of the Science of Food and Agriculture **(3)**, Marine Biology, New Phytologist **(10)**, Plant and Soil **(6)**, Plant Biotechnology Journal, Plant Physiology **(17)**, Plant Science, Planta **(4)**, Soil Science, The Bryologist, Water Research, Water, Air, and Soil Pollution*

Book Chapter Review

2004 *Biogeochemistry of Trace Elements in the Rhizosphere*, Elsevier

Peer-Review of Conference Proceedings

2006 Computational Approaches to Metabolomics, 2007 Pacific Symposium on Biocomputing

2006 Proceedings of the Biological Solutions for Site Remediation, Restoration and Rehabilitation (BIOSOLR3) Symposium

Textbook review

2010 *Environmental Plant Physiology*, Taylor and Francis Group

2008 *Biology: Science for Life* 3rd edition, Pearson:Prentice Hall Publishers

2007 *Web of Life*, Brooks-Cole Publishing

2006 *Concepts in Biology*, McGraw-Hill Higher Education

2004 *Biology: Today and Tomorrow*, Brooks-Cole Publishing

Proposal Review

2012 National Science Foundation, Basic Research to Enable Agricultural Development (Bread) Program

2011 U.S. Army Corps of Engineers' Engineer Research and Development Center

2011 Iraq Science Fellowship Program, U.S. Civilian Research and Development Foundation

2010 Iraq Science Fellowship Program, U.S. Civilian Research and Development Foundation

2010 U.S. Army Corps of Engineers' Engineer Research and Development Center

2009 Thomas F. & Kate Miller Jeffress Memorial Trust, Commonwealth of Virginia

2009 Louisiana Board of Regents

2009 U.S. Army Corps of Engineers' Engineer Research and Development Center

2008 Ralph E. Powe Junior Faculty Award, Oak Ridge Associated Universities

2008 National Science Foundation, Molecular and Cellular Biology Division

2007 U.S. Civilian Research and Development Foundation

2006 U.S. Army Corps of Engineers' Engineer Research and Development Center

2006 USDA, National Research Initiative Competitive Grants Program

2006 Louisiana Board of Regents

2006 Academy of Sciences of the Czech Republic

2005 Swiss National Science Foundation

2005 National Science Foundation, Integrative Organismal Biology Division

2004	National Science Foundation, Integrative Organismal Biology Division
2004	National Science Foundation, 2010 program
2004	TALENT fellowship, Netherlands Organization for Scientific Research
2004	U.S. Civilian Research and Development Foundation
2003	National Science Foundation, Integrative Plant Biology
2003	National Science Foundation, Ecological and Evolutionary Physiology
2003	National Science Foundation, SBIR/STTR program, Phase II proposals
2002	U.S. Geological Survey, National Institutes for Water Resources
2002	U.S. Department of Energy, Environmental Management Science Program
2002	U.S. Civilian Research and Development Foundation
2001	U.S. Civilian Research and Development Foundation
2001	University of Wisconsin Water Resources Institute
2001	U.S. Department of Energy, Office of Energy Research
2001	National Science Foundation, SBIR/STTR program, Phase II proposals
1998	U.S. Department of Energy, Office of Energy Research

Proposal Panel Review

2011	NIH/NIEHS Special Emphasis Panel, Superfund Basic Research Program
2010	NIH/NIEHS Special Emphasis Panel, Superfund Basic Research Program
2010	NSF SBIR/STTR Phase IB, Plant Agriculture Panel
2009	NSF SBIR/STTR Phase IB, Agricultural Biotechnology Panel
2006	NSF SBIR/STTR Phase IB, Environment Treatment Panel
2005	USDA, National Research Initiative Competitive Grants Program
2005	NIH/NIEHS Special Emphasis Panel, Superfund Basic Research Program
2004	USDA, National Research Initiative Competitive Grants Program
2004	NIH/NIEHS Special Emphasis Panel, Superfund Basic Research Program
2004	EPA, National Center for Environmental Research

Other Professional Synergistic Activities

2012	Editor-in-Chief for Inorganics, *International Journal of Phytoremediation*
2011-present	Treasurer, International Phytotechnologies Society
2011-present	Faculty member, Environmental Resource and Policy PhD program
2011	Session co-chair, "Stormwater and Greenroofs", The 8th International Phytotechnologies Conference, Sept 14-16, Portland, OR.
2010-2011	Senior Associate Editor for Inorganics, *International Journal of Phytoremediation*
2009-present	Member, Ecotoxicology program
2009	Session chair, "Metals in terrestrial systems", The 6th International Phytotechnologies Conference, Session C2, Dec 2-4, St. Louis, MO.
2009	Associate Editor, *International Journal of Phytoremediation*
2007-2009	Editorial Board, *International Journal of Phytoremediation*
2004-2006	Editorial Board, *Environmental Pollution*
2003-present	Member, Center for Ecology
2002-2003	American Society of Agronomy Tri-Society Special Committee on Biosecurity
2002	Moderator, 94th Annual Meeting of the Illinois State Academy of Science
2002	Poster Judge, 94th Annual Meeting of the Illinois State Academy of Science

2002 Session chair, "Phytoremediation of metal contaminated soils", ASA-CSSA-SSSA Annual Meeting, Division S-11, Nov 10-14, Indianapolis, IN.

2000 Session chair, "Soil metal loading and phytoremediation", ASA-CSSA-SSSA Annual Meeting, Division S-11, Nov 5 – 11, Minneapolis, MN.

1999 Phytostabilzation/phytosequetration working group, Workshop on Phytoremediation of Inorganic Contaminants, U.S. Department of Energy Nov 30 - Dec 2, 1999 Chicago, IL.

Honors and Awards (Service)

2009 Excellence in Review Award, *Environmental Science & Technology*

IX. COMMUNITY SERVICE

2011 Judge, Region 8 Science Fair

2009 Judge, Region 8 Science Fair

2009 Guest lectures in two biology courses at Shawnee Community College

2008, 2010 Organized a Science Day for Carbondale Community High School students

2005-2008 Project paper review committee, Illinois Junior Science and Humanities Symposium

2004, 2009 Judge, Region 8 Science Fair

2004 Presenter, Illinois Junior Science and Humanities Symposium

2004 Liquid nitrogen magic show, Science Night, Lewis School, Carbondale

2001-2004 Expand Your Horizons

2001-2003 Illinois Junior Science and Humanities Symposium

2001 Liquid nitrogen magic show, Science Night, Winkler School, Carbondale

2000-2001 Science Fair Judge, Illinois Junior Academy of Science