Phytotechnologies
6th International Conference

December 2-4, 2009
Hyatt Regency
St. Louis Riverfront

By the International Phytotechnology Society
Special Acknowledgements
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Thank you to the following supporters:

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6th International Phytotechnologies Conference
Forward

In the planning and organizing how to best present the great research that is represented in this document, we clearly see that the 6th International Phytotechnologies Conference is more international and more technologically broad than ever before. Without question, our field is still growing and expanding. When the Phytoremediation: State of the Science Conference was first held in Boston in May 2000, the focus was primarily looking at individual plant-contaminant interactions and identifying potential degradation mechanisms and contaminant fate. We stand at this conference discussing genetic engineering, biofuels production, and long term success, and we are investigating novel compounds and engineered nanoparticles in plant systems, before they are even classified as environmental contaminants. We also look at representative from around the globe, with abstract submissions from 26 countries to represent a truly international field. Not only is there active research globally, full scale applications are impacting our world.

The seeds planted in Boston and by the small group gathered in the one room have also grown into a flourishing young journal and an international organization that works to nurture this conference and disseminate much of the great work represented here through the International Journal of Phytoremediation. The International Phytotecnology Society is thriving and this conference has expanded to 21 sessions held in three concurrent tracks. While it is unfortunate we can’t see all of our colleague’s work, the expansion of great research is a great problem to have.

We also welcome you to St. Louis, the Gateway City. We hope that this conference offers a fantastic opportunity to interact with colleagues from around the globe. We see this as a Gateway to a continued advancement of green remediation and technologies that will have a sustained position in the betterment of our environment.

Phytotechnology Society Overview

The International Phytotechnology Society (IPS) is a nonprofit, worldwide professional society comprised of individuals and institutions engaged in the science and application of using plants to deal with environmental problems.

IPS’s mission is to promote research, education, training, and application of those technologies that use plants to deal with problems of environmental contamination, carbon sequestration, alternative fuels, and ecological restoration.

IPS is open to all researchers, practitioners, regulators, site owners and interested and concerned individuals who want to promote a natural way to deal with environmental problems.
Tuesday, December 1, 2009

8:30 a.m. - 5:30 p.m.
Pre-Conference Workshops:
   Phytotechnology (Phyto-3, 2009)
   Greenroof Technologies & Related Practices in Buildings

Wednesday, December 2, 2009

7:30 a.m. - 6:00 p.m.
Registration Desk Open

7:30 a.m. - 8:30 a.m.
Continental Breakfast

8:30 a.m. - 9:00 a.m.
Opening Session – Welcome

9:00 a.m. - 10:00 a.m.
Keynote Speaker – Dr. Peter Raven

10:00 a.m. - 10:30 a.m.
Plenary Speaker – Dr. Bill Suk

10:30 a.m. - 11:00 a.m.
Break

11:00 a.m. - 11:30 a.m.
Plenary Speaker – Dr. Alan Baker

11:30 a.m. - 12:00 p.m.
Plenary Speaker – Dr. Dennis Hazel

12:00 p.m. - 1:30 p.m.
Lunch (on your own)

1:30 p.m. - 3:00 p.m.
Concurrent Sessions:
   Session A-1: Phytomonitoring
   Session B-1: Genetic Engineering and Systems Biology (I)
   Session C-1: Restoration

3:00 p.m. - 3:30 p.m.
Break

3:30 p.m. - 5:20 p.m.
Concurrent Sessions:
   Session A-2: Persistent Organic Pollutants
   Session B-2: Genetic Engineering and Systems Biology (II)
   Session C-2: Metals in Terrestrial Systems

5:20 p.m. - 7:00 p.m.
Poster Session I
Reception & Cash Bar
Visit Exhibits

7:30 p.m.
Phytotechnology Society Business Meeting
Thursday, December 3, 2009

7:00 a.m. - 8:00 a.m.
Continental Breakfast

7:30 a.m. - 6:00 p.m.
Registration Desk Open

8:10 a.m. - 10:00 a.m.
Concurrent Sessions:
  Session A-3: Nano
  Session B-3: Green Infrastructure/Storm Water
  Session C-3: Green Roof

10:00 a.m. - 10:30 a.m.
Break

10:30 a.m. - 12:00 p.m.
Concurrent Sessions:
  Session A-4: Plant Interactions with Novel Contaminants
  Session B-4: Groundwater
  Session C-4: Covers

1:30 p.m. - 3:00 p.m.
Concurrent Sessions:
  Session A-5: Biofuels
  Session B-5: Explosives and Munitions
  Session C-5: Sustainability

3:00 p.m. - 3:30 p.m.
Break

3:30 p.m. - 5:20 p.m.
Concurrent Sessions:
  Session A-6: Long-term Trials
  Session B-6: Metalloids in Terrestrial Systems
  Session C-6: TPH-PAH

5:20 p.m. - 7:00 p.m.
Poster Session II
Reception & Cash Bar
Visit Exhibits

7:30 p.m.
Int’l Journal of Phytoremediation
Editor’s Meeting

Friday, December 4, 2009

7:30 a.m. - 12:00 p.m.
Registration Desk Open

7:30 a.m. - 8:30 a.m.
Continental Breakfast

8:30 a.m. - 10:20 a.m.
Concurrent Sessions:
  Session A-7: Wetlands
  Session B-7: Salt/Selenium
  Session C-7: Endophytes

10:20 a.m. - 10:40 a.m.
Break

10:40 a.m. - 12:00 p.m.
Plenary Session

12:00 p.m.
Conference Adjourns

1:00 p.m. - 5:00 p.m.
Post Conference Tour
Participation of annexin 1 in the response of Arabidopsis thaliana seedlings to lead exposure: potential for phytoremediation

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Heavy metal pollution has become a serious public health and environmental concern. Lead (Pb) is one of the heavy metals known to bioaccumulate in plants. Phytoremediation is an emerging technology based on the ability of green plants to remove Pb from the environment in a cost-efficient and ecologically sound manner. Currently, an important research focus is to seek a better understanding of the mechanisms of Pb tolerance by plant cells, with the aim of genetically engineering plants with improved tolerance to Pb, and hence better phytoremediation capabilities in the near future.

Annexin, a calcium-dependent membrane-binding protein is believed to play a role in many essential cellular processes. It has been shown that expression of annexin genes from Arabidopsis thaliana are differentially regulated in response to a variety of abiotic stresses. Thus annexins are likely be involved in the response of plants to heavy metal stress. This study aimed to obtain new insights into whether annexin 1 (AnnAt1), is involved in Pb tolerance in plant cells. Message levels of AnnAt1 were assessed in response to Pb treatments using quantitative realtime PCR. Expression results were analysed using REST 2008 and normalized against the mitosis protein YLS8. We found that Pb effect on AnnAt1 expression in plants exposed to lower Pb concentrations (25 M, 50 M, and 75 M) was not significantly different from the controls. However, AnnAt1 message levels doubled (2.12fold, S.E. range is 1.77 – 2.61, p < 0.001) in seedlings treated with 100 M Pb, in comparison to the control plants. The relative contribution of AnnAt1 in defence against Pb stress will be discussed.

Keywords: lead (Pb), annexin, AnnAt1, Arabidopsis thaliana, stress, realtime PCR

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