

CONFERENCE REVIEW



## “13th International Phytotechnologies Conference” Hangzhou, China September 26–29, 2016

Jing Song<sup>a</sup>, Yongming Luo<sup>b</sup>, and Jason C. White<sup>c</sup>

<sup>a</sup>Key Laboratory of Soil Environment and Pollution Remediation, Institute of Soil Science, Chinese Academy of Sciences, Nanjing, People's Republic of China; <sup>b</sup>Institute of Coastal Zone Research, Chinese Academy of Sciences, Yantai, People's Republic of China; <sup>c</sup>Connecticut Agricultural Experiment Station, New Haven, CT, USA

Six of the manuscripts in this current issue of the *International Journal of Phytoremediation* were presented at the 13th International Phytotechnologies Conference. The Conference was co-sponsored by the International Phytotechnology Society, Institute of Soil Science of the Chinese Academy of Sciences, Zhejiang University and BCEG Environmental Remediation Co., Ltd. (BCEER). The meeting showcased six presentations in the plenary session and 98 presentations in 15 parallel sessions, and more than 40 posters. Three hundred and fifteen attendees included 168 Chinese participants and 147 attendees from overseas. Besides mainland China, participants attended from USA, Canada, Germany, the Netherlands, UK, France, Italy, Belgium, Switzerland, Austria, Denmark, Spain, Czech Republic, Slovakia, Poland, Australia, New Zealand, Japan, Korea, India, Pakistan, Malaysia, Thailand, Iran, Columbia, South Africa, Hong Kong, and Taiwan regions.

The opening ceremony, chaired by Conference Chairman Prof. Yongming Luo, took place on September 27th and included welcome presentations from Prof. Renfang Shen, Chairman of China Society of Soil Sciences, Director of Institute of Soil Science, Chinese Academy of Sciences; from Dr. David Tsao, the President of the International Phytotechnology Society; and from Prof. Xiangyang Xu, Deputy Dean of College of Resources and Environment, Zhejiang University. The plenary session started with a presentation from the 2016 Gordon Award winner Prof. Ming-Hung Wong on ecological restoration, followed by a water treatment using constructed wetlands talk by Dr. David Tsao, an arsenic uptake and translocation mechanisms talk by Prof. Fangjie Zhao. The plenary finished with an overview of phytoremediation of contaminated soil by Prof. Xiao-e Yang.

The balance of the first day of the conference consisted of five parallel sessions: (1) Phytoextraction of heavy metal contaminated soils, chaired by Prof. Caixian Tang and Prof. Yanqun Zu. Experiences on the full-scale application of phytoextraction in mainland China and Taiwan region were presented. (2) Emerging contaminants, chaired by Prof. Tomas Vanek and Dr. Elizabeth Rylott. This session covered

a range of pollutants including pharmaceuticals, personal care product (oxybenzone), explosives (TNT) and antibiotics. Interesting studies on phytoremediation of pharmaceuticals at the field scale was presented. (3) Constructed wetlands and wastewater treatment, chaired by Dr. David Tsao and Prof. Xiangliang Pan. Contaminants covered in this session included heavy metals, cyanide, COD, and oil. (4) Mechanisms for metal tolerance and accumulation, chaired by Prof. Frederic Pitre and Dr. Lingli Lu. Plant mechanistic response at the genetic level was highlighted. (5) Phytostabilization and chemical immobilization of soil metals, chaired by Prof. Michel Mench and Prof. Joel Burken. In this session, work on biochar, biosolids, compost, and iron grit for contaminated soil and mine tailing remediation were discussed. A presentation from Dr. Jintian Li drew attention to changes in microbial community structure following phytostabilization of an extremely acidic copper mine tailings.

The second day of the conference featured six parallel sessions in the morning and four parallel sessions in the afternoon. Six morning sessions included (1) Microbe-assisted phytoremediation of soil metals, chaired by Prof. Ying Teng and Prof. Yahua Chen. The potential of halophilic bacteria, AM fungi, and ECM fungi were explored. (2) Plant-nanoparticle interactions, chaired by Dr. Jason White, Prof. OM Parkash Dhankhe, Prof. Jorge Gardea-Torresdey, and Prof. Elena Maestri. This session discussed physiological and molecular response of plants to metal nanoparticles. (3) Methods to enhance plant tolerance to mixed contaminants, chaired by Dr. David Tsao and Ms. Carolina Dhamera. (4) Phytoremediation of organic contaminants, chaired by Prof. Lee Newman, Prof. Zhihong Xie, and Dr. Jing Dong. Organic contaminated discussed in this session included PAHs, PCBs, DDT/DDE, atrazine, and dyes. (5) Phytotoxicity and phytomonitoring of environmental pollutants, chaired by Prof. Joel Burken and Prof. Slawo Lomnicki. A phytosampler was proposed as a novel approach for particulate air monitoring with high sampling density. (6) Air phytoremediation, chaired by Prof. Stanislaw Gawronski and Dr. Nele Weyens.

The four afternoon parallel sessions on day 2 included (1) Ecological restoration and soil revitalization, chaired by Prof. Nicolas Dickenson and Dr. Marta Marmiroli. (2) Bioenergy, biofuels, and bio-products, chaired by Prof. Nelson Marmiroli and Prof. Cinzia Forni. (3) A special session for PhytoScholars (recipients of an NIEHS travel grant), chaired by Prof. Jason White and Prof. Alan Baker. (4) A special session on the potential of international collaboration in a Center of Excellence on Bioremediation, chaired by Prof. Xiao-e Yang and Dr. Jan Japenga.

The platform presentations of the conference finished with two plenary talks. Prof. Erik Smolders illustrated the concept of bioavailability of soil metals and implementation in environmental legislation. Prof. Yongming Luo showed field applications of phytoremediation of contaminated agricultural soils in China.

Throughout the meeting, poster sessions were highly interactive and provided many young scientists with a chance to discuss their work with more experienced colleagues.

The closing session was chaired by Prof. Lee Newman. Dr. David Tsao awarded the winners of the student poster and oral presentations. Prof. Michel Labrecque announced that the 14th International Phytotechnology Conference

would be held in Montreal Canada (September 2017). Details concerning this and future conferences can be found at <http://www.phytosociety.org/>. Closing remarks were then made by Prof. Yongming Luo.

More than 30 students from both China and overseas attended a one-day training course on September 29th which was given by Dr. David Tsao. The training course aimed to offer a hands-on introduction to using plants for environmental cleanup with emphasis on upland systems in the morning and constructed wetlands in the afternoon. The training course was enthusiastically supported and rated by student participants.

All conference participants greatly appreciated the hospitality and efforts of the organizers both during and after the conference. The 2016 conference in Hangzhou was the second IPC conference held in China (first in Nanjing in 2008). This venue, along with the previous Nanjing meeting, highlighted the research and development of phytotechnologies in China and Asia and provided a splendid occasion for the American and European scientists to learn from and interact with their Asian colleagues. The conference offered great opportunities for all participants to discuss future collaboration on phytotechnologies to address global environmental problems.