OMICS Group Conferences
Accelerating Scientific Discovery
Global Biofuels & Bioproducts Summit
November 19-21, 2012 Hilton San Antonio Airport, USA

Recent advances on the use of rhizofiltration to treat aqueous waste contaminated by heavy metals

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Heavy metal pollution in water is a major environmental problem facing the new millennium. Most of the currently used technologies of removing heavy metals from water may be expensive if large volumes and high clean-up standards are involved. In a past research, we showed that *Nicotiana tabacum* (tobacco) plants effectively remove toxic metals, such as Pb, Cd and Cr from aqueous polluted solutions. This process is called: ***Rhizofiltration***. Rhizofiltration takes advantage of the fact that living plants are natural solar driven pumps, which can extract and concentrate particular elements from the environment.

We developed a rhizofiltration prototype system using low-cost materials that holds up to 64 plants with roots immersed in flowing contaminated water and treat more than 200 litres of polluted water in a recirculation system. Estimates indicate that our system may compare favourably with metal recovery from currently employed water treatment technologies. In addition of the cost-effectiveness, our system has technological advantages such as applicability to many real conditions, ability to treat high volumes, lesser needed for chemicals, reduced volume of secondary waste, possibility of recycling and the almost secure likelihood of regulatory and public acceptance. As a first approach, we used our system to reduce toxic metals and waste volume from aqueous wastes generated in the chemistry laboratories of our local university. The volume of toxic waste produced as a result was a fraction of the original volume and the associated costs to dispose the waste were considerably reduced.

Biography

U. J. Lopez-Chuken completed his Ph.D. from the University of Nottingham, UK in 2006. He is the Head of the Environmental Science Lab at the UANL. His major areas of expertise include various aspects of contaminated land assessment and remediation, in particular developing models of metal transfer through the human food chain and metal phytoextraction. Other of his research areas includes the application of bioremediation (phyto- and phyco-) for metal-contaminated effluents treatment. He has published more than 12 papers in JCR journals.

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