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Phosphorus amendment reduces the toxicity of chromium as in case of *Raphanus sativus*

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The toxicity of chromium (mainly Cr6+), a heavy metal is common in both plants and animals. However, there are certain soil nutrients like phosphorus (P), that interfere with the Cr during the uptake process in plants. The toxic effect of Cr and its amelioration by P was determined, in terms of physiological and anti-oxidative parameters, in *Raphanus sativus* L. The experiment was conducted as two factor randomized 5x5 design, where five concentrations of Cr was supplied for 28 days to *R. sativus*, and each Cr concentration was amended with 5 concentrations of P. The dose dependent physiological toxicity was recorded as increase in the accumulation of Cr along with decrease in the levels of total chlorophyll in leaves, biomass, total P and N contents of roots. The oxidative toxicity was visible as increase in the levels of superoxide dismutase (SOD), catalase (CAT), peroxidise (POD) enzymes as well as malondialdehyde (MDA) contents. Among the P amended samples, there was marked decrease (of up to 3-folds) in the toxicity of Cr, as there was improvement in the chlorophyll and biomass contents along with decrease in the levels of antioxidant enzymes such as SOD, CAT and POD, as well as MDA. The above results may contribute to the society in the sense that if P content of fertilizers is increased, the amount of Cr entering into the food chain via primary producers decreases leading to lower level of biomagnifications in the forthcoming trophic levels of food chain.

Biography

Shardendu has obtained his MSc and PhD degrees from Banaras Hindu University, Varanasi, India. He is presently serving Patna University, India as Associate Professor in Botany, and holding the post of Coordinator of Undergraduate studies in Environmental Science in the department. He is a successful researcher with more than 35 publications in various national and international journals like New Phytologist, Environment International, Chemosphere, Ecotoxicology and Environmental Safety etc., with various impact factors.

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Anaerobic wastewater treatment

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Anaerobic wastewater treatment is an ideal method of biological treatment of any wastewater which contains biodegradable (organic) matter. If such water is let off untreated, putrefaction of the organic matter takes place which besides harming land and ground water also results in aesthetic nuisance due to its obnoxious odour, colour etc. On the other hand, if such wastewater is systematically treated anaerobically, it would result in water free of organic matter and also generation of energy in form of biogas. A consortium of bacteria is involved in the anaerobic process and hence a mixed culture taken from cowdung can be effectively used for the anaerobic treatment of wastewater. The process can also be diverted for the production of hydrogen gas, a cleaner fuel, by pre-treating the mixed culture initially. Pre-treatment of the culture enables the enrichment of robust hydrogen producers and also deactivates the hydrogen consumers. Common pre-treatment methods can be by heating the culture, by treating it with acid or alkali, by exposing it to microwaves etc. Hence by optimizing different parameters, waste can be effectively converted into energy.

Biography

Radhika Singh has done her Masters in Chemistry from Indian Institute of Technology Delhi and Doctorate in Biochemical Engineering and Biotechnology from the same Institute. Her thesis was on "Anaerobic Biodegradation of Phenol" in which she worked for the conversion of phenol-containing wastewater to biogas. She joined her alma mater, Dayalbagh Educational Institute from where she did her graduation, in 1998 as Technician Grade I and became Assistant Professor in 2006. Since then she has guided more than 25 MSc and 5 MPhil dissertations in anaerobic waste (both solid and liquid) treatment. She has two PhD students under her. She has published 20 papers in national and international journals and has attended 20 national and international conferences.

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