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### Health hazards of pulp paper mill waste containing residual organic pollutants after secondary treatment and their detoxification by biostimulation process

The effluent discharged from pulp and paper industry retains various recalcitrant and androgenic compounds even after secondary treatment by industry, but detail knowledge is not yet available regarding the properties of residual organic pollutants discharged from pulp paper industries and their detoxification process. Therefore, the study has been focused to detect the residual organic pollutants of pulp and paper mill effluent after biotreatment in industry and their degradability with biostimulation process. The major identified compounds were as 2, 3, 6-Trimethyl phenol; 2-methoxyphenol or guaiacol; phenol,2,6-dimethoxy or syringol; methoxy cinnamic acid; pentadecane; Octadecanoic acid, trimethylsilyl ester; cyclotetracosane; 5,8- dimethoxy-6-methyl-2,4-bis (phenylmethyl) naphthalen-1-ol and 1,2-benzendicarboxylic acid disononyl ester. While, majority of these compounds are listed Endocrine Disrupting Chemicals (EDCs) as environmental toxicants. Some of these compounds were lignin monomers which are metabolic products during secondary treatment process of industry in discharged effluent. The supplementation of carbon (glucose 1.0%) and nitrogen (peptone 0.5%) biostimulated the degradation process. Therefore, degraded sample after biostimulation process showed either disappearance or generation of metabolic products at optimized conditions i.e. rpm (150), temp ( $37 \pm 1^\circ\text{C}$ ) after 3 and 6 days of bacterial incubation. Isolated potential autochthonous bacteria were identified as *Klebsiella pneumoniae* IITRCP04 (KU715839), *Enterobacter cloacae* strain IITRCP11 (KU715840), *Enterobacter cloacae* IITRCP14 (KU715841) and *Acinetobacter pittii* strain IITRCP19 (KU715842). In addition, the study also revealed that there was generation of lactic acid, benzoic acid and vanillin as value added products during the detoxification of effluent in biostimulation process from residual chloro-lignin compounds. This also supported the commercial importance of this process.

#### Biography

Dr. Ram Chandra is currently Professor in Department of Environmental Microbiology at Babasaheb Bhimrao Ambedkar (A Central) University, Lucknow, India. His major lead work at National and International level is on phytoremediation of heavy metals from industrial waste disposal site for eco-restoration of pollutants affected area mainly on phytoextraction of heavy metals from complex organo-metallic waste of pulp paper mill waste and distillery waste disposal sites. In addition, praiseworthy contributions also have been made by him on bacterial degradation of chlorolignin compounds from pulp paper mill effluent and maillard product of sugarcane molasses based distillery waste. He has more than 140 publications in his credit published in national and international peer reviewed journal.

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