

Bioremediation of Paper Mill Effluent by Microbial Consortium Comprising Bacterial and Fungal Strain and Optimizing the Effect of Carbon Source

Authors : Priya Tomar, Pallavi Mittal

Abstract : Bioremediation has been recognized as an environment friendly and less expensive method which involves the natural processes resulting in the efficient conversion of hazardous compounds into innocuous products. The pulp and paper mill effluent is one of the high polluting effluents amongst the effluents obtained from polluting industries. The colouring body present in the wastewater from pulp and paper mill is organic in nature and is comprised of wood extractives, tannin, resins, synthetic dyes, lignin, and its degradation products formed by the action of chlorine on lignin which imparts an offensive colour to the water. These mills use different chemical process for paper manufacturing due to which lignified chemicals are released into the environment. Therefore, the chemical oxygen demand (COD) of the emanating stream is quite high. For solving the above problem we present this paper with some new techniques that were developed for the efficiency of paper mill effluents. In the present study we utilized the consortia of fungal and bacterial strain and the treatment named as C1, C2, and C3 for the decolourization of paper mill effluent. During the study, role of carbon source i.e. glucose was studied for decolourization. From the results it was observed that a maximum colour reduction of 66.9%, COD reduction of 51.8%, TSS reduction of 0.34%, TDS reduction of 0.29% and pH changes of 4.2 is achieved by consortia of *Aspergillus niger* with *Pseudomonas aeruginosa*. Data indicated that consortia of *Aspergillus niger* with *Pseudomonas aeruginosa* is giving better result with glucose.

Keywords : bioremediation, decolourization, black liquor, mycoremediation

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