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Editorial

Role of Fungi in Environmental Biotechnology

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Disposal of toxic organic chemicals is a major environmental concern because these compounds are recalcitrant and pose a serious health hazard to the environment. Much effort has since been directed towards enhancing biodegradation of these toxic compounds in the environment. The main constraints of effluent discharges from the hazardous industry are absorbable organic halides which are usually biologically persistent and in some cases are also toxic. Conventional wastewater treatment, such as activated sludge or aerated lagoons, is known to be not completely effective in treating chlorolignins and color. Evidently, biological systems, which currently seem most promising in the treatment of bleachery effluents, are those supporting wood-degrading fungi. A White-rot-fungus *P. chrysosporium* has been shown to have nonspecific potential to degrade many persistent toxic organic chemicals such as PCB's, PCP, DDT, several PAH's. Nearly fifty organopollutant compounds can be degraded by *P. chrysosporium* promising its usage in wastewater treatment systems. The chlorinated lignin derivatives present in combined bleachery effluents can be degraded by *Trametes versicolor*. Another group of fungi are noted for their abundance in lignin-rich environments. These are being in particular members of Aspergillus and Penicillium sp. which are normally soil inhabitants but despite of their abundance in lignin rich environments, these received little attention in lignin degrading studies, as compared too White-rot fungi [1].

The organisms that are capable of metabolizing pesticides and herbicides are fairly diverse, including genera of both bacteria and fungi. Pseudomonas species are capable of growing on xenobiotics, which are chemically synthesized compounds that have never existed naturally, as a sole source of carbon and energy. Some of the most widely distributed xenobiotics are the herbicides and pesticides. The usage and therefore existence in wastewaters has increased dramatically in the past years [2].

One of the most common forms of iron and sulfur in nature is pyrite (Fe_2S) and it is very common in bituminous coals and in many ore bodies. Bacterial oxidation of sulfide minerals is the major factor in the formation of acid mine drainage, a common environmental problem in coal mining regions. *Thiobacillus ferroxidans* oxidizes sulfide minerals via microbial leaching which g plays a major role in the concentration of copper from low grade copper ores. If the concentration of metal ore is low it may not be economically feasible to concentrate the mineral by conventional means. Microbial leaching is especially useful for copper ores because copper sulfate formed during the oxidation of the copper sulfide ores is very water soluble. In almost any ore pyrite is present and the oxidation of this pyrite leads to the formation of ferric iron which is very good oxidant for sulfide minerals. Reaction of the copper sulfide with ferric iron results in the solubilization of the copper and the formation of ferrous iron. In the presence of oxygen at the acidic pH *Thiobacillus ferroxidans* reoxidizes the ferrous iron to ferric form so that it can oxidize more copper sulfide [3].

It should be noted that the examples given above are the one that have come forward in the literature. This short essay was written in order to underline that the role of microorganisms in environmental biotechnology is undeniable.

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