BIOSURFACTANT NANOEMULSION-A NOVEL TECHNIQUE FOR TEXTILE EFFLUENT TREATMENT

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Abstract - The most challenging effluent which contributes to water pollution is textile effluent, since it utilizes many organic and inorganic chemicals, especially dyes. Textile wastewater containing dyes is dangerous to the whole ecosystem and environment. These must be decolorized before discharging into the main stream water bodies. Solvent extraction using reverse micelles of surfactants is a novel, easy and cost effective method for the removal of dyes from the effluent. Great importance has recently been given to the environmental impacts caused by synthetic surfactants due to their toxicity and non-biodegradability. Bio-surfactants can be used as alternatives to chemical surfactants due to their low critical micelle concentration (cmc) and biodegradability. In this study, nano emulsions of bio-surfactants (saponin and lecithin) are used to study the removal of dyes from binary mixture of cationic dyes (Basic Yellow-2 and Basic Red-12). Reverse micelles are nanometer-sized aggregates of surfactant molecules surrounding microscopic water-core in non-polar solvents. The parameters examined in this study were effect of equilibration time, effect of pH, effect of temperature, effect of surfactant concentration and effect of initial dye concentration. Various techniques such as TEM, FTIR and optical microscopy were used for the analysis of bio-surfactant nano-emulsions.