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A STUDY ON BIOSURFACTANT AND BIOFLOCCULANT ACTIVITIES OF NOSTOC CONSORTIA

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Abstract

Fast paced industrialization is leading to the use of large quantities and varieties of synthetic chemicals, which are considered to be xenobiotic and adds to the environmental pollution. Oil contamination is one of the most dangerous pollution factor which poses a threat on marine life and the death of hundreds of marine organisms. Various physical and chemical methods are being discovered / invented every day to reduce this risk. The most reliable method is bioremediation. Bioremediation is the process/technique wherein microorganisms make use of organic pollutants for its growth and cellular processes and is recognized as an economical and effective treatment for these contaminations. Microorganisms used to perform the function of bioremediation are known as bioremediators. Many cyanobacterial cultures are available among which *Nostoc sp.* proves to fix more atmospheric nitrogen yielding more EPS. *Nostoc* species has various applications in agriculture, food and as bioremediators. Out of these many applications, we have evaluated the biosurfactant and bioflocculant applications in this work. Biosurfactants are microbial surface active agents produced by certain microorganisms during their growth phase. Substrates for biosurfactant production are sugars, oils, alkanes and waste materials. Biosurfactants are amphiphilic, non-toxic and biodegradable molecules with high specificity. The flocculation process mediated by microorganisms or their products is referred to as bioflocculation. The FTIR results of *Nostoc* confirmed the presence of Exo Poly Saccharide (EPS) suggesting that EPS of *Nostoc* can be used as an efficient flocculant, by attracting the ions that are present in the domestic water. X-Ray Diffraction analysis was also done for the EPS of *Nostoc* which exhibited good crystalline property thereby stating that it can be stable for a longer period of time. Thus exo polysaccharides from *Nostoc species* can act as a good flocculant compared with the commercial flocculants like xanthan gum, guar gum etc. Also, they can be used as emulsifiers and gelling agents in food industry and pharmaceutical industry.

Keywords: *Nostoc sp.*; bioremediation; biosurfactant; exo-polysaccharides;