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Maximizing the biomass of micro alga *Chlorella minutissima* by optimizing the light conditions and carbon sources

Gaurav Saxena, Lakhan Kumar, Shahid Hariri, Arpita Roy, Koyel Kundu and **Navneeta Bharadvaja**
Delhi Technological University, India

Overexploitation and hazardous consequences of use of fossil fuel led us to think about those solutions of energy which should not only be renewable but carbon neutral also. A strong debate on the issue of future energy has provided some solutions and bio-energy is one of the possible solutions as it complies the aim of renewability as well as there is no hazardous consequences after its use. So development of such type of technologies that can provide bio-energy in future is need of the hour. Microalgae have been considered as best source to provide bio-energy due to their enormous potential of growth, higher content of sugars, lipids, pigments, easy to culture etc. But these organisms are well affected by different environmental factors. So, it is necessary to optimize the culture conditions of microalgae so maximum biomass can be achieved. In this study, effect of various components of light such as light color, intensity, period has been studied and their effects on biomass of micro alga *Chlorella minutissima* were noticed. In addition of light, various carbon sources were also used to see their effect on biomass yield. The type and shaking of culture vessel are also important factors that affect the biomass yield as naturally algae live in running water. Thus experiments were also set up to see the effect of different culture vessels and shaking period. The light conditions, carbon source and type of culture vessels and their shaking period have been optimized for this micro alga.

navneetab@dtu.co.in

Degradation of PAHs by *Paenibacillus dendritiformis* strain by gravimetric method

Shallu Sihag and **Hardik Pathak**
JECRC University, India

The increased anthropogenic activities such as incomplete combustion of coal, wood and petroleum, also the road accidents, mining accidents, shipping transportation etc., have a dramatically effects the soil pollution with PAHs. The priority pollutants are of great concern in the environment. The microorganisms play a critical role in the removal of these toxic and mutagenic poly aromatic hydrocarbons. The hydrocarbon degrading microbial strain was purchased from IMTECH, Chandigarh, India. The GC-MS (Shimadzu model QP-2010 plus, column-Rtx-5MS, 30 meter×0.25 mm i.d×0.25 um film thickness) was used to separate and identify the aliphatic and aromatic fractions of oil present in the 2T engine oil. The morphological characterization (Gram's staining), biochemical characterization (catalase test, IMVIC test, starch hydrolysis etc.) and molecular characterization (16s RNA sequencing) was performed. The maximum degradation of the *P. dendritiformis* strain was obtained 63% after 28 days in the shaker fermentation process. The conversion of high molecular weight compound to the low molecular weight compounds indicated the partial degradation of Nonacosane and Tetracontane by the *P. dendritiformis* strain T168 by gravimetric method in 35 days of fermentation.

cul.tanya@gmail.com