EFFECT OF CULTURE CONDITIONS ON GROWTH AND BIOSURFACTANT PRODUCTION BY DIFFERENT SOIL FUNGI

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Abstract: Surfactant molecules are amphipathic molecules with both hydrophilic and hydrophobic moieties, that partition preferentially at the interface between fluid phases with different degrees of polarity and hydrogen bonding such as oil/water and air/water interfaces. Synthetic surfactants used to increase contaminated solubility are often toxic, representing an additional source of contamination. Microbially produced surface active compounds have similar properties but are less toxic, biodegradable and can be produced in situ, at the contaminated sites. In the present investigation the main aim was to determine the culture conditions for maximum biosurfactant production growth by different soil fungi isolated from different soil samples. Screening of biosurfactant producing fungi were carried out on the basis of lipolytic activity. Screened fungi were identified as Aspergillus niger, Aspergillus flavus, Rhizopus nigricans and Penicillium sp. Biosurfactant production is a secondary metabolism, it is directly related with growth phase. Our results demonstrated that biosurfactant production was substantially enhanced when the initial pH of the culture medium, types of carbon and nitrogen sources, temperature and incubation period of growth were optimized. Maximum biosurfactant production was obtained when 0.1% (weight/volume) KNO₃ was used as nitrogen source. GN- medium was used. In summary amongst all the four selected isolates, Rhizopus nigricans showed optimum growth and emulsification activity at pH -6.5, temperature-28°C, 2.5% (weight/volume) of glucose as substrate, and 7-days of incubation period. Biosurfactants are likely to gain wide acceptance since they are readily biodegradable and have lower toxicity as compared to their chemically synthesized counterpart.

Keywords: GN, biosurfactant, isolated fungi.