

Isolation and Screening of New Bacterial Strains from Soil for the Production of Cellulase

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ABSTRACT

Introduction: There are various microorganisms present in soil in which bacteria is one of them. Bacteria are unicellular micro-organisms and they secrete extracellular cellulase to degrade cellulose (solid waste) and convert into glucose. Cellulase enzyme earns consecutively increasing demand in industries so we isolate the 3 strains of cellulase producing bacteria after streaking plate and congo red staining method and produce cellulase enzyme by using CMC as a substrate and took their activity by DNS method.

Objective:

- To discover and isolate cellulase-producing bacterial strains from soil samples, utilizing streak plate and Congo red staining methods.
- To analyze the cellulolytic activity of the isolated bacterial strains using carboxymethyl cellulose (CMC) as the substrate.
- To determine and quantify cellulase activity through the DNS (3,5-Dinitrosalicylic acid) assay.

Methodology: Soil sample was collected from the garden. Nutrient broth and nutrient agar were prepared for bacterial growth. The soil solution was prepared using serial dilution. The bacteria were isolated using the streaking plate method. The screening of isolated bacteria was done using the Congo red staining method. The cellulase enzyme was produced from an isolated bacterial culture. Bacterial culture enzyme activity was taken by the DNS method. Read the absorbance by using a spectrophotometer at 546 nm.

Result: In this study, I was isolated the newly strains of cellulase producing bacteria (DM1 DM2 and DM3) from soil by serial dilutions and streak plate method using 0.5% CMC broth and agar media and collects the bacterial strains after 24 hours of incubation at 37 °C. Screening the isolated bacteria by congo red staining method which is recognized by clear zone around the cellulase producing bacteria. Production of enzyme and their activity was taken by DNS method.

Conclusion: This research was planned to isolate the cellulase-producing bacteria from the soil by serial dilutions and streaking plate method. Screened the isolated bacteria by Congo red staining method and produced cellulase enzyme by using CMC as a substrate. Enzyme activity was analyzed by DNS method which concludes that DM1 shows more activity than others DM2 and DM3.

Keywords: CMC, DNS, Isolation, Staining.

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