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Physical nature of culture media alters microbial amylase enzyme production

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Microorganisms are of great importance in the production of industrial enzymes, such as amylase, cellulase, protease and lipase. Amylases are the most important enzymes used in Biotechnology. These starch degrading amylolytic enzymes are vital in industries dealing with food, fermentation, textile, paper, pharmaceuticals and sugar. Microbial enzymes are preferred to those from both plant and animal sources because they are cheaper to produce, and their enzyme contents are more predictable, controllable and reliable. Efficacy of microbial enzyme production depends on the nature of the culture media. This study was conducted with the objective of identifying the effect of the physical nature of culture media on microbial amylase production.

One bacterium (Bacillus sp), one fungus (Aspergillussp) and a fungal-bacterial biofilm (FBB) developed from the formers (method of biofilm formation is not revealed due to Intellectual Property Right reasons) were inoculated separately to two physically different culture media (solid and liquid). No microbes were added to the control. The experiment was arranged in a Completely Randomized Design (CRD). Amylase enzyme assays were conducted after 2 and 4 weeks of incubation and surface attachments and biofilm formation of the microbes were observed weekly using a microscope. Data were analyzed by ANOVA and Student's t-test.

Bacillus sp and FBB showed good biofilm formation. The bacterial biofilm significantly improved amylase enzyme production in liquid medium, whereas in solid medium FBB showed the highest enzyme production. According to this study, microbial amylase enzyme production varied with the physical nature of the culture media. Therefore, it is concluded that amylase enzyme production depends on the selection of the physical nature of the culture medium according to industrial requirement. Further studies are however required to understand the effects and potentials of these microbial systems.