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Antibacterial metabolite production using submerged actinomycetes cultivation

Joshua N Batangan

Antibiotics are usually used to fight bacterial infections. But, the recent advancement in technologies has also proven actinomycetes as a limitless source of such killing chemicals (antibiotics). However, the volume of essential metabolites obtained through traditional solid culture cultivation can be minimal and the product quality can be difficult to monitor. On the other hand, the recent techniques for the production of mycelial biomass, the submerged cultivation technique of mycelia, has been widely used as an alternate source for developing bioactive chemicals. According to researchers’ findings, alternate sources also have various advantages, such as shorter incubation periods and easier culture conditions. This substitute uses liquid media where certain microorganisms or fungal organisms are incubated and then subjected to constant, high agitation. It is conceivable to use such an alternative way since actinomycetes can create mycelia. Firstly, the Actinomyces species are assessed using a low-cost indigenous liquid medium that includes mature coconut water, potato broth, rice-bran broth and corn grits broth. The influence of pH, light, temperature and shaking conditions on biomass production are evaluated for the positive media with the highest mycelial output. These novel and optimised physical parameters are then employed to mass-produce actinomycetes mycelia. After ramification, mycelia are harvested and the bioactive substances are extracted. Upon filtering the harvested mycelia, the culture is used for antibacterial testing. Therefore, this optimised culture technique for the production of antibiotics from actinomycetes has proved to be significantly effective for improving the yield of bioactive substances.

Keywords: Submerged cultivation, Bioactive, Optimisation, Actinomycetes, Mycelia, Parameter, Mass-produce

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