Advancements in Environmental Biotechnology

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CHAPTER 7

CYANOBACTERIAL STRAIN *PLECTONEMA BORYANUM*AS A POTENT SOURCE OF BIOACTIVE COMPOUND: C-PHYCOCYANIN

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Abstract

Cyanobacteria are prokaryotic micro-organisms that carry out photosynthesis through the oxygen evolution utilization process. They are morphological, physiologically, and structurally different from each other which helps them to adapt to environmental factors. They produce a large number of bioactive compounds. At the commercial level, by modifying the strategies used in culture medium synthesis of bioactive compounds can be enhanced. Also, help in lowering the cost of the manufacturing process. Experiments are carried out by altering the concentration or character of ingredients of media. A better medium supports the faster growth rate and higher cell concentration. Due to one at a time strategy complication and time-consuming process, the classical method is less preferable while the statical approach gives a systematic and efficient method for experimentation. Cyanobacteria have a long history of fossils. They are found all over the world including land and water. They create a symbiotic relationship with fungi, plants, animals, and the man terrestrial ecosystem. They can produce neurotoxic, hepatotoxic, tumor-causing secondary metabolites. Some cyanobacteria create two types of specialized cells- Hetrocyst and Akinetes. Cyanobacteria have a wide range of applications in biotechnology e.g. mariculture, food, feed, fertilizer, medicines, and pollution control. In addition, they produce many secondary metabolites e.g. cyanotoxin, Siderophores, photo-protective protease, antimicrobial agents. *Plectonema boryanum* is a strain of the cyanobacterium that produces C-phycocyanin, a bioactive compound. C-phycocyanin has an assembly of heterodimers composed of α and β subunits called phycobiliprotein monomers and respective chromophores linked via a thioether bond. Phycocyanin is used as a natural protein dye in food, cosmetics, medicines, and pharmaceuticals. It is used in diagnosis as well as microscopy to detect the molecules.

Keywords: Bioactive compounds, phycobiliprotein, media optimization, pigments, biomass