

Advancements in Environmental Biotechnology



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AARGON PRESS

New Delhi

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© Edition, 2021

Published by

Aargon Press

EG-130, Inderpuri,

New Delhi-110012, India

Tel.: +91-11-9958121300

Email: info.aargonpress@gmail.com

Website: www.aargonpress.com

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ISBN: 978-93-94070-17-2

Printed at: Aargon Press, New Delhi

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CHAPTER 10

Role of nitrogen sources in the Production of C-Phycocyanin from Cyanobacteria

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Abstract

Cyanobacteria are gram-negative prokaryotes and also called blue-green algae, blue-green bacteria, or Cyanophyta that carry out photosynthesis to get their energy. They have originated 3.5 billion years ago, They are a significant part of the marine nitrogen cycle and also a primary producer in many areas of the ocean, but are also found in other habitats like freshwater lakes, soil, etc. they do not have flagella therefore they show their motility by gliding. They reproduce asexually. They have four layered cell walls made up of peptidoglycan. They produce a large amount and a large number of secondary metabolites e.g. Microcystis, Anabaena, Nostoc, and Oscillatoria. Some cyanobacteria also produce some toxins as well as bioactive compounds. Also, they have a cholesterol-lowering effect in animals and humans. Cyanobacteria are very helpful to humans as it has a wide range of applications in food, pharma, cosmetic, fuel, fertilizer, and pollution control. Phycobiliproteins, found in cyanobacteria are used as a natural color in food, medicines, and cosmetics. Cyanobacteria used local basic resources like pH, temperature, incubation time, salinity, carbon and nitrogen sources, and amino acids to enhance the production of bioactive components. In cyanobacteria, the main component used for photosynthesis is chlorophyll-a chlorophyll-b and chlorophyll-care absent. In addition, cyanobacteria produce some other metabolites like Cryptophycin, Cyanovirin-N, and Borophycin.

Keywords: Heterotroph, Pharmaceutical, Nitrogen fixation, secondary metabolites, and Phytoplanktons