C-PHYCOCYANIN FROM MARINE SPIRULINA TECHNOLOGY

BRIEF DESCRIPTION:

The food industry is experiencing a shift in consumer preference, from artificial ingredients to natural ingredients. This changing trend has triggered the production of phycocyanic, which acts as a nutritious protein-pigment complex in several food and beverage applications. Its characteristic antioxidant, anti-aging, hepatoprotective and anti-inflammatory properties are increasingly gaining consumer attention in food, pharmaceutical and cosmetic industry. The market of C-PC has expanded several folds after its recognition by European Union as a permitted secondary coloring agent for foods. The cyanobacteria, namely, Spirulina (renamed as Arthrospira), has been commercialized in several countries for its use as health food and for therapeutic purposes due to its valuable constituents particularly proteins and vitamins. It is also a rich and inexpensive source of the pigment like phycocyanin. C-phycocyanin (C-PC), a phycobiliprotein, is one of the key pigments of Spirulina, a microalgae used in many countries as a dietary supplement. The bright blue colored C-Phycocyanin (C-PC) is an accessory photosynthetic pigment belonging to the phycobiliprotein family. C-PC has found applications in food coloring and cosmetics due its unique blue color, which indeed has few natural replacements.

SALIENT FEATURES AND APPLICATIONS:

- The developed Technology standardized the marine Spirulina culture in 2 ton FRP raceway ponds with proven production of biomass (2.3 g/L) and C-PC under outdoor conditions. Further, testing of large-scale culture in 25 tons capacity raceway ponds at seafront facility is in progress.

- The Institute has 50 tonne capacity paddle wheel operated raceway pond for pilot scale testing, electro flocculation system for large scale harvesting and continuous flow high volume centrifuge for dewatering and the necessary technical expertise to provide technical assistance and guidance for setting up the project and implementation.

Technical Specification:

Microalgal strain	*Spirulina sp.NIOT-155*
Culture medium	Modified organic media
Water source	Natural seawater
Biomass production	2.3 g/L
Extraction process	Modified green extraction method
C-phycocyanin yield	130-150 mg/g
Purity ratio	2.5 to > 4.0 after purification
Energy consumption	Low due to short extraction time

Marine Spirulina cultured in 300L photobioreactors

Marine Spirulina cultured in open 2 ton raceway

Scale of Development: Technology demonstrated and commercialized.

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