



Study of Production and Extraction of Carotenoids from Microorganisms

• Swetnisha • Sada Nizami • Aadrika • Aditi Chauhan

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Corresponding Author : **Swetnisha**

Abstract: Carotenoids are naturally occurring pigments synthesized by plants, algae, some bacteria and fungi. These pigments have diverse applications, including their use in health supplements due to their antioxidant properties, in cosmetics for anti-aging and UV protection, in pharmaceuticals and in food and textiles as natural colourants. While synthetic colourants are commonly used in commercial production, they pose significant risks to both human health and the environment due to their toxic, non-biodegradable nature. This has led to an increasing demand for natural, biodegradable dyes that are safer for human health. Microbial pigments, in

particular, have gained considerable industrial interest due to their greater stability and solubility compared to plant and animal-derived pigments. Additionally, microorganisms replicate rapidly, ensuring high pigment yields year-round. In this study, the objective was to isolate pigment-producing bacteria from three distinct soil samples. Yellow and orange pigmented bacteria were successfully isolated, cultivated into pure cultures, and subsequently characterized through morphological and biochemical tests.

Keywords: Carotenoid, Pigment production, Isolation, Identification.

Swetnisha

Assistant Professor, Department of Microbiology,
Patna Women's College (Autonomous),
Bailey Road, Patna-800 001, Bihar, India
E-mail: swetnisha291@gmail.com

Sada Nizami

B.Sc. III year, Microbiology (Hons.), Session : 2022-2025,
Patna Women's College (Autonomous),
Patna University, Patna, Bihar, India

Aadrika

B.Sc. III year, Microbiology (Hons.), Session : 2022-2025,
Patna Women's College (Autonomous),
Patna University, Patna, Bihar, India

Aditi Chauhan

B.Sc. III year, Microbiology (Hons.), Session : 2022-2025,
Patna Women's College (Autonomous),
Patna University, Patna, Bihar, India

Introduction:

Carotenoids are a large and diverse group of natural pigments that are important in the biology of plants, algae and microorganisms. Many fruits and vegetables have an abundance of red, yellow, and orange hues due to these pigments. Carotenoids shield bacteria from oxidative harm by squelching singlet oxygen and free radicals. Additionally, they help photosynthetic bacteria and algae absorb light for the process of photosynthesis.

Synthetic colours have been widely applied in the food, textile, cosmetic, and pharmaceutical industries. However, concerns regarding toxicity issues associated with synthetic pigments have encouraged high-level research into natural sources for such colourants. Among these, pigment-producing microorganisms offer promising potential against current challenges. (Muneefa et al, 2019)