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Isolation, Identification, and Optimized Production of Prodigiosin from a Novel Strain of *Serratia nematodiphila* using Cost-Effective Substrates

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Prodigiosin, a potent red pigment derived from microorganisms, possesses wide range of biological activities, including antimalarial, antifungal, immunosuppressive, and anticancer properties, making it highly valuable for applications in medicine, cosmetics, etc. This study focuses on the production, purification, and characterization of prodigiosin from a novel strain of *Serratia nematodiphila*, originally isolated from dry coconut. The identity of this strain was confirmed using 16S rRNA gene sequencing. A solvent extraction method was developed for efficient extraction and purification of the pigment. Bioprocess parameters such as Carbon source, Nitrogen source, pH, etc were optimized using statistical experimental designs like Response Surface Methodology. Further works to explore novel, cost-effective substrates, including agro-industrial wastes (e.g., Rice water, sugar cane juice, whey, fruit peels) and oils (e.g., castor oil, palm oil, coconut oil, etc) were done to evaluate their suitability for supporting Serratia growth and prodigiosin biosynthesis.

Keywords: Agro-industrial waste, Bioprocess optimization, Cosmetic applications, Prodigiosin, *Serratia nematodiphila*

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