

Eco-Friendly Textiles: Harnessing the Power of Natural Dye

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Abstract : This paper explores the historical significance, ecological benefits, and contemporary applications of natural dyes in textile dyeing, aiming to provide a comprehensive overview of their potential to contribute to a sustainable fashion industry while minimizing ecological footprints. This research explores the potential of natural dyes as a sustainable alternative to synthetic dyes in the textile industry, examining their historical context, sources, and environmental benefits. Natural dyes come from plants, animals, and minerals, including roots, leaves, bark, fruits, flowers, insects, and metal salts, used as mordants to fix dyes to fabrics. Natural dyeing involves extraction, mordanting, and dyeing techniques. Optimizing these processes can enhance the performance of natural dyes, making them viable for contemporary textile applications based on experimental research. Natural dyes offer eco-friendly benefits like biodegradability, non-toxicity, and resource renewables, reducing pollution, promoting biodiversity, and reducing reliance on petrochemicals. Natural dyes offer benefits but face challenges in color consistency, scalability, and performance, requiring industrial production to meet modern consumer standards for durability and colorfastness. Contemporary initiatives in the textile industry include fashion brands like Eileen Fisher and Patagonia incorporating natural dyes, artisans like India Flint's Botanical Alchemy promoting traditional dyeing techniques, and research projects like the European Union's Horizon 2020 program. Natural dyes offer a sustainable textile industry solution, reducing environmental impact and promoting harmony with nature. Research and innovation are paving the way for widespread adoption, transforming textile dyeing.

Keywords : historical significance, textile industry, natural dyes, sustainability

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