

Extraction & optimization of natural herbal colourant from different natural origin for using in textile industry

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Due to the harmful effects of most of the synthetic dyes, there is move to find renewable sources to supplement the need for safe dye industry and the research has led to revive the production of natural dyes on commercial scale. Today, nearly, 40,000 dyes and pigments are listed which consist of over 7000 different chemical structures. Overall at present more than 100,000 dyes and pigments are used industrially with a rough estimated production of 7×10^5 — 1×10^6 tons per year. The big consumers of synthetic dyes are textile, leather tanning, paper, printing, food, coke, wood preserving chemicals, pesticide, cosmetics, paint, pigments, plastics, pharmaceutical as well as iron-steel industries. In addition, petroleum-based products such as waxes, lubricating oils, polishes, and gasoline are colored with dyes. Dyes are also used to stain biological samples, fur, and hair. Hence the effluents of these industries as well as those from plants manufacturing dyes tend to contain dyes in sufficient quantities. As a result, considerable amount of colored wastewater is generated. Approximately 12% of synthetic dyes are lost during manufacturing and processing operations and 20% of these lost dyes enter the industrial wastewaters. Textile industries consume two thirds of the dyes manufactured. With the rising awareness of the occurrences and accumulation of synthetic dyes in aquatic environment which has intensified numerous deteriorations on several ecosystems and seriously threatens the human health and environment, the enforcement of stringent rules and regulations concerning the emission of contaminants from industrial waste streams by various regulatory agencies has been promulgated. Simultaneously, a developing research by the invention of alternative dye sources with varying levels of successes has accelerated a dramatic progress in the scientific community. As such, the interest of natural dyestuffs has revived in Europe, Japan and United States. Revival of the application of natural dye on cotton, silk, wool, jute etc has gained momentum all over the world possibly due to the ban on some of the synthetic azo dyes by the government of several countries. Natural dyes derived from flora and fauna are believed to be safe, but all the natural colorants on textiles may not be safe; sometimes the method of application of the colorants using some metallic mordants may make them non-friendly to our environment. However, natural dyes have a potential; for high value-added fabrics, particularly for export market. Unfortunately, very little work has been done on dye extraction from flowers and leaves. When the plant organs like roots, stem etc are used for dye extraction, the whole plant is destroyed whereas if soft organs like flowers and leaves are used for the extraction, the plant is not at all destroyed. It is more eco-friendly and does not cause any damage to the plant.

Keywords: Natural dye, natural colorant, Response surface methodology, Optimization.

Biography

Papita Das Saha has completed her PhD from Jadavpur University and at present she is Assistant Professor at Department of Biotechnology, National Institute of Technology - Durgapur. She has published 44 International journal papers and 7 national Journal papers and 10 International books and one book chapter. She is also service as an editorial board member of six reputed International journals like Journal of Environmental Research and Management; Research Journal of Environmental Sciences; Journal of Environmental Science and Technology; Research Journal of Environmental Toxicology; International Journal of Chemical Technology; Current Research in Chemistry.

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