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# Utilisation of Sepalika (*Nyctanthes arbor-tristis*) Flowers, a Temple Waste as a Source for a Potential Colouring Agent for Textile Substrates Used in the Textile Industry

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## Abstract

The island of Sri Lanka is a mass of land where the plant life is very rich and vibrant with all shades of green colour leaves and multicoloured flowers. There are around 3500 flora species in Sri Lanka and about one quarter of that is endemic to the country. A huge amount of flowers are widely cultivated in tropical and subtropical regions in Sri Lanka.These flowers are used as decoration, medicinal purposes or for offering to Buddha and God. A survey report on flora of Ceylon reveals that 40% of the total productions of flowers are unsold and wasted daily, they are thrown into water or dumped into landside causing water pollution as well as environmental pollution. These wasted flowers can be used in various ways and we can get wealth from waste materials. This research reveals one of the options of waste management and pollution control strategies.

A vast array of colourants obtained from natural sources such as plants, insects/animals and microbes have been scrutinized in recent past for their use in different kinds of applications. Research into new natural dye sources along with eco-friendly, robust and cost effective technologies for their processing and application have greatly aided in widening the scope of natural dyes in various traditional and advanced application disciplines. Today textile and fashion trade is a global industry of significance. However, from a national perspective becoming greener by using natural dyes may at this stage of transition prove to be quite beneficial. This study explores such an opportunity.

Sepalika flowers (*Nyctanthes arbor-tristis*) (Harshingar, Parijat) belongs to the family Oleaceae. The flower has white petals with an orange calyx. *Nyctanthes* stems have been found to be a rich source of antioxidants. The aqueous extracts of the flower, calyx and petals were evaluated for cotton dyeing and found to be excellent fixing properties of dyes on fabric. This signifies that the main colour yielding part is in the orange coloured calyx of the flower. In this research, attempts have been made to carry out an innovative study with the *Nyctanthes* flower as a part of an exploration for a cheap natural dye source. In this study, Sepalika flower extract was used to dye bleached cotton fabrics with metal mordants to achieve acceptable colour shades and fastness levels. The dyed fabrics with Sepalika flower extracts were investigated with pre-mordanting, simultaneous mordanting and post mordanting conditions at optimum dyeing parameters. These dyed fabrics were investigated for their fastness properties. These fastness properties showed excellent to moderate results.

In this research innovative dyeing with Sepalika flower extracts were shown to give good dyeing results. Pretreatment with 1-2% metal mordant and by using 5% of plant extract (owf) was found to be optimum and showed very good fastness properties for bleached cotton fabrics.

***Keywords:*** Waste management, Pollution control, Dyeing, Mordanting, Fastness properties