

# Traditional Cotton Dyeing with Natural Dyes from Plants: Colourimetric Analysis and Antibacterial Efficacy

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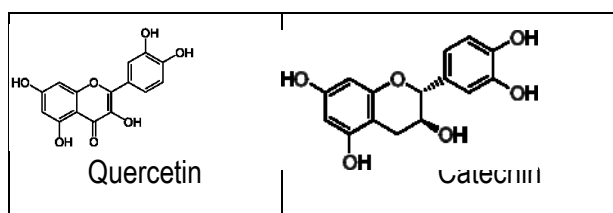
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## Abstract

100% cotton single jersey fabric (weight 160 g/m<sup>2</sup>) was dyed with the natural colourants extracted from the leaves of Neem (*Azadirachta indica*) and Holy Basil (*Ocimum sanctum/ tenuiflorum*) and heartwood of Catechu/Khoyer (*Acacia catechu*) following traditional exhaust method of dyeing. A high concentration of dye was maintained for dyeing all three colourants with differential mordanting techniques (no mordanting, pre-mordanting, simultaneous mordanting and post-mordanting). Potassium alum [K<sub>2</sub>SO<sub>4</sub>.Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>.24H<sub>2</sub>O] was used as mordant. Colourimetric analysis was done using an industry grade spectrophotometer "Datacolor 650" (USA). Colour-fastness to wash of all dyed samples were tested according to ISO 105:CO3 method at 60°C for 30 minutes. All dyed and one undyed samples were tested by The AATCC test method 147-2004 to investigate their efficacy against 4 microorganisms including *Bacillus cereus* (ATCC 11778), *Escherichia coli* (ATCC 25922), *Pseudomonas aeruginosa* ATCC (27853), *Staphylococcus aureus* (ATCC 25923). Finding shows that there is significant colour difference between the unmordanted-dyed samples and mordanted-dyed samples for all three colourants and shades vary depending on mordanting techniques also. Simultaneous-mordanted-and-dyed samples exhibit poorer colour-fastness to wash in comparison to pre- and post-mordanted and dyed samples. No dyed sample was found to be effective against any of the bacterium tested which can be explained by the low solubility of plant phenolic compounds in aqueous medium as reported in published literature.

Keywords: Natural dyes, Neem, Holy Basil,  
Catechu

Natural colourants:



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