

Eco-friendly process for dyeing banana fabrics with curcuma natural dyes

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Abstract

Banana fibers have a lot of superior physical and chemical properties which can be used as an excellent raw material for the textiles and packaging industry.

Banana, cotton blended woven fabrics were prepared by using different composition and histological structure. (based on three different banana fiber ratios in weft direction (50% banana: 50% cotton, 33.4% banana: 66.6% cotton & 25% banana: 75% cotton) respectively. With three weave structures (plain 1/1, twill 2/2 and satin 4) that differ from each other in the float length.

The objective of this research is to establish a suitable natural dyeing process for banana woven fabrics, then make a comparison between dyeing behavior of banana fabrics with cotton fabrics. Curcuma dye as an eco-friendly dye was studied to clarify the impact of natural dye with comparative studies of the K/S and over all fastness properties of dyed samples on natural banana/cotton (plain, twill and satin) fabrics. Finally, the dye uptakes and the color fastness behavior of the samples have been investigated with regards to the mordents and fiber ratios and weave structures.

Color Testing was conducted to assess the color properties between dyed banana fabrics, and cotton fabrics as well as plain, twill, and satin fabrics. Color measurements were performed by using a Data-color spectrophotometer.

Results showed that the banana fabrics can be dyed with Curcuma dye successfully. K/S values of banana samples are higher than cotton samples, irrespective of the nature of the mordant used. K/S values of the simultaneous mordanting acquired higher values than the pre-mordanting irrespective of the fabric (with plain, twill or satin constructions) used.

Color fastness to rubbing, and perspiration properties of blended banana/cotton is better than the cotton.

Therefore, cotton dyeing process can be applied for the banana fabrics. Dyeing of banana fiber was carried out with a natural curcuma type of dye, which provided better washing fastness properties than cotton fibers.

Keywords:

Banana fabrics, color fastness properties, dyeing, eco-friendly, curcuma dye, woven fabrics.