Abstract

India is second largest producer for jute in the world. The inherent properties of jute includes silky luster, good tensile strength, high moisture absorption, heat and fire resistant, dimensional stability, antistatic properties, highly dyeable and also good thermal conductivity property. (ref: ministry of textiles) But along with these advantages, there are a few disadvantages like harsh feel, stiffness, coarseness, poor wash ability and poor abrasion resistance. The stiffness of fabric has great impact on its bending length or drape co-efficient. These drawbacks restrict its use other than packing material. Its utility can be enhanced by overcoming these drawbacks.

Jute has inherent colour which is another drawback to develop colour palatte on jute. These can be overcome by pretreatments. For this study, beaching and woolenization were the two pretreatments which were decided to improve the properties of jute. The primary object of jute bleaching was to get maximum whiteness with minimum loss in strength and retention of whiteness for a longer period. Woolenization is a typical process generally used for jute yarn for imparting crimps in its structure. The crimpness imparted offers wool-like appearance to the fibre which helps in producing fabric which is more compact and also smooth.

Substantial researches have been carried out on the effects of different bleaching agents on jute and dyeing of jute with natural dyes but the correlation between effects of bleaching agents on dyeing performance of jute using different natural dyes is to be explored. Bleaching on jute brings out internal changes in the fibre and therefore it is expected that it will affect the physical properties also. Bleaching results in increasing whiteness index which gives the base for colouration. Bleaching with Hydrogen peroxide, Peracetic acid and sequencial bleaching was carried out in this study. In order to optimise the bleaching recipes, time (60, 90, 120 minutes) were varied for both the bleaching agents whereas for hydrogen peroxide concentration (6%, 8%, 10%) and for peracetic acid pH (6 and 7) was varied. The optimized condition for Hydrogen peroxide was 10% concentration at 90 minutes. For Peracetic acid pH was kept at 7 at 90 minutes. In case of sequential bleaching the sample was first treated with peracetic acid and then it was again bleached with 10% concentration of Hydrogen peroxide. Also, the jute fabric was woolenized using sodium hydroxide using the standard recipe to impart softness.

Dyeing of jute with synthetic dyes sometimes affects its environmentally friendly nature. Hence, in this study, only four natural dyes viz. madder, turmeric, eucalyptus leaves and Indian almond leaves were used. The jute fabric was pre and post mordanted with alum, copper sulphate and ferrous sulphate in pilot work. From the pilot work, it was observed that pre mordanting was better compared to post mordanting. Alum was selected as pre-mordanting agents for further work amongst the three mordants viz. alum, copper sulphate and ferrous sulphate used earlier. Beside alum, Harda was used as natural mordant and copper was converted to nano form and used as mordanting agent in this study.

To look into the applicability of these modified and dyed fabrics, four jackets were constructed out of ten jackets. Two natural dyes namely Turmeric (root source) and Indian almond leaves (leaf source) were selected for dyeing these finalized jackets. Two jackets in each dye were pre mordanted and dyed with turmeric and Indian almond leaves.