

Determination of quality and utilization of Aramine fibres from the plant *urena lobata* as a textile fibre in Kenya

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Since Kenya imports most of the vegetable fibres apart from cotton and sisal, there is need for research in the development and utilisation of other vegetable fibres sources. This study however, was aimed at analysis the quality of aramina fibres from the plant *Urena Lobata* that grows widely and as a weed in Kenya. Specifically the study was to determine the chemical and physical properties of aramina fibres, make sample yarns from fibres using hand-spinning methods, construct sample articles using simple hand techniques and compare the aramina fibre qualities with the established properties of a textile fibre. The methodology used was experimental and involved extraction of the fibre by retting process, situational observation of the experiments and note taking as well as making of sample articles. The analysis was done both qualitatively and quantitatively, and the results presented in terms of reports, tables and figures. The experiments were carried out at Kenya Bureau of Standards (Textile Quality Control Laboratory) where the necessary conditions for textile testing were maintained at temperature $20^{\circ}\text{C} + 2^{\circ}\text{C}$ and Relative Humidity $65 + 2\%$. The carding, spinning and dyeing process were carried out at the Fine Art department (Kenyatta University) The process of extraction of aramina fibres has not been documented. However, Joseph (1986), and Ghosh (1993) argue that the fibre can be extracted in a similar manner as jute. Therefore, the process of jute fibre extraction was adapted whereby the barks were stripped off from the wooden portion and subjected to partial rotting by immersion in water. The process took two (2) weeks and about 2.6 kg of fibres were obtained from 22 kg of unretted green bark. The unretted bark contained impurities and moisture hence were much heavier than the dry fibres. The fibres were then subjected to various fibre tests. The fibre was found to have a staple length of 13.5 cm and burning characteristics like those of other natural cellulose fibres such as cotton and linen. The fibre has a moisture regain value of 9.7%, 42.9% stronger when wet than dry and percentage elongation was recorded to be 1.035 when dry and 1.3% when wet. The wetness of the fibre has significant effect on the elongation as well as on fibre strength (tenacity) which was found to be 2.0 g/d for the wet fibres while that of the dry fibres was found to be 1.4% g/d. Chemically the fibre is affected by acids and this implies that the fibre cannot be dyed using dyestuffs that are acidic or stored in acidic solvents and this property is important in the formation of oxycellulose used in the manufacture of regenerated fibres. The fibre was found to be resilient and pliable. This quality made it possible to be spun into yarn, which was later, dyed and made into articles. Various methods used to make the articles include crocheting, plaiting, hand weaving, card weaving and macramé knots. The articles made include a shoulder bag, a tablemat, a floor mat, a belt, a plant hanger and a toothpick holder cover. In short, the fibre was found to qualify as a

textile fibre and can be recommended for usage in the textile industry both at large and small scale. Since it's locally available, cheap to obtain and of good spinning and dyeing quality it can be of a great use in the "Jua Kali" sector.