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Editorial Open Access

Editorial

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It gives me immense pleasure to write this first editorial of Journal of Textile Science & Engineering. It is an open access journal, which is a novel concept in the Textile field, even though now well established in other scientific fields. Textile research is a worldwide activity and many researchers may not be able to access the subscription based scientific journals and in this context open access journals are significant. The journal is published by the OMICS Group who has proven experience in open access science publishing. The open access and complete digital flow will ensure that the published papers are available to everyone at any time without any cost. This first issue contains selected papers on jute packages, reflectance spectra, recycling, etc.

As it is well known, the scope of textiles is very vast starting from fibres and going beyond the garments or SMART textiles on one side and technical textiles on the other side. There was a time when it was thought that textiles are destined only for fashion and apparel. But now, they are well established in other sectors like aeronautics, construction and automobiles offering comfort or forming an integral light-weight part of the system. Each section of the textile manufacturing or processing technology is very wide in itself and the dyes and auxiliaries sector is another broad area, which has direct applications on textiles.

Natural fibres have been fundamental to society since the dawn of civilisation, but over the past century they have been partially replaced by man-made or synthetic fibres. Considering its importance, the United Nations celebrated 2009 as the International Year of Natural Fibres, with the objective of expanding the use and promoting more innovative uses of natural fibres. Among natural fibres, many are still under exploited as in the case of bast fibres like hemp, flax, sisal, jute, coco, pineapple, banana, etc. These renewable and highly durable raw materials are traditionally used for packaging or other household uses but have a real untapped potential to replace the petroleum based synthetic fibres. Promoting these fibres also boost the traditional agriculture of the developing economies where they are produced. Unlike in earlier times, novel technologies like enzyme treatments are now available for the separation of bast fibres. Further, chemical modification and surface functionalisation can lead to high quality technical products with insulation properties, fire resistance, UV resistance, antimicrobial properties, etc.

The introduction of renewable resources in technical textiles sector is not only important ecologically but also economically: for eg., when the oil price increases by a factor of two, the price of standard polypropylene (PP) increases by 40%. The price for technical hemp and flax fibres has remained nearly constant for last ten years. Bast fibres as such may not be suitable for technical uses due to their inherent drawbacks, but technological innovation can lead to the development of functional textile materials ready for implementation on industrial scale and adapted for the specific end applications, without contributing to an increase in CO_2 emission. For example, the development of natural bast fibre based geotextiles with enhanced mechanical and functional properties can improve the environmental impact of geotextiles.

Textile field is constantly evolving and the whole textile manufacturing concept is fast changing. Nanofibres are a reality now. Another upcoming area of fibre science is the development of bio-fibres like PLA, which has properties similar to polyester. Once upon a time, it was impossible to think of making a fibre out of potato or maize.

In the mean time, some scientific areas which have imparted great influence on textile processing sector are biotechnology, nanotechnology and surface treatments like plasma and laser. Antibacterial, UV resistant and non-halogen FR finishing are some important areas of textile functionalisation whereas digital printing and applications of photochromic, thermochromic or phosphorescent pigments have more to offer than just decorative applications. New alternative dyeing systems like microemulsions, liposomes, micelles, etc. as well as the use of hydrolysed proteins are being tried. Microcapsule applications provide aesthetic as well as functional properties and thermal regulation to textiles and their novel reactive shells can be fixed on the textiles without any binders. Meanwhile denim jeans and garment washings are evolving into more ecological processes involving enzymes and even to waterless laser technology.

Natural dyes, natural finishes and eco-processing of textiles along with textile and effluent recycling are gaining momentum, thus making the whole textile chain more sustainable. The textile industry consumes lot of energy and a large quantity of water. To produce 1kg of finished product, the textile wet processing industry needs 200-500 litres of fresh water. Thus energy and water savings along with sustainable and responsible production are the key to success in the textile industry. One needs to re-invent the end use of textiles through technological innovation making it capable of serving future markets.

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