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INFLUENCE OF SLUG CATCHER ON QUALITY OF TASAR SILK YARN

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Abstract

Tasar weavers in India have been using Korean & Chinese tasar silk as warp and Indian tasar silk as weft since decades. With many types of tasar silk yarns available for consumers, it becomes imperative to assess the quality of the yarn and grade them to signify its use for particular end usages. Major issue in tasar silk reeling is the sloughing-off of bunch of filaments from the cocoon during reeling process, which abruptly reduces the quality of reeled tasar yarn. In this study, attempts have been made to use two different types of slug catchers during tasar reeling by wet reeling method and assess its influence on the quality of the reeled tasar silk.

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Keywords: Silk fibre; Tasar silk; Silk yarn quality; Slug catcher; tasar reeled silk yarn.

1. Introduction

In the age of competitive market of apparel textiles, yarn quality and its grading has become very important for particular end use. In fact there has never been an urge for testing and grading as marketing and consumption of tasar silk yarn in India have no problem due to its large demand and limited production. Also there are no distinct and separate organized activities like reeling/spinning and weaving production line in tasar silk similar to that in mulberry in India, female members of the tasar weavers family generally produce yarn and utilize the same for weaving and by then supply to the Mahajan's or co-operative societies to earn their livelihood. Gradual popularization of mechanized yarn production through introduction of reeling machines suitable for tasar silk in India has been creating a separate yarn producing centers. It had encouraged making attempt in some regions in the field to grade the tasar silk based on its proximity to target denier, colour uniformity, type of skeining / lacing done as well as presence of flosses and knots. Now with the thrust given on the increased productivity, it is time to assess the quality of yarn being produced like mulberry raw silk and grade it to facilitate fair transaction. Due to wide

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variability in all the cocoon parameters, low NBFL, cooking constraints and reelability, the quality of tropical tasar raw silk never rise to the level of quality of mulberry raw silk and therefore the procedures and norms applicable for mulberry do not reflect the true picture of silk for tasar.

In a study on physical characteristics and structure of Indian silk fibres, it is observed that the silk filaments from same cocoon show considerable variation in linear density. As one moves from the outer layers to inner layers of the cocoon, mulberry silk is finest followed by muga and tasar. They have also observed differences existing between the different varieties and the extent of lengthwise variations within a cocoon [Gupta et.al, 2000]. They observed that denier of the filament decreases considerably from the outer to the inner layers. Das and Ghosh (2009) have studied cohesion properties of tasar silk yarn based on peeling force. Sen and Babu (2004a) have worked on macro-characterization and analysis of amino acid composition of different silks including tasar silk.

Sen and Babu (2004b) have also studied the structure–property correlations in silk fibres covering both mulberry (bivoltine and crossbreed) and three non-mulberry silks (tasar, muga, and eri). Even they have studied detailed analysis of the micro-structural parameters and mechanical properties. Rajkhowa et.al. (2007), studied on stress-strain and recovery behaviour of Indian silk fibres and their structural dependence. The tensile stress-strain and recovery behaviour of all the four commercial varieties of Indian silk fibres have been studied along with their structures. Das et.al. (2005), have studied structural and property variants of mulberry and tasar silk filaments. The tensile behaviour of fully degummed filaments of two commercial varieties of silk produced in India namely mulberry (Bombyx mori) and tasar (Antheraea mylitta), has been investigated in dry and wet state. Narendra and Yiqi (2010) have reported the structure and properties of cocoons and silk fibres produced by the wild silkworm Hyalophora cecropia. The tensile properties of fibres from all the three layers of cecropia cocoons were reported to be similar to that of B. mori silk and better than that of the other wild silks

Das and Ghosh (2010) have investigated the progressive change in filament characteristics from outer to inner layers of mulberry and tasar cocoons. The physical properties and residual sericin content of the silk filament were evaluated in relation to its position in different layers of cocoons corresponding to daba (Antheraea mylitta), oak tasar (Antheraea proylei), and bivoltine mulberry (Bombyx mori) varieties. Subrata Das and Anindya Ghosh worked on distributions of natural broken filament length for tasar silks. The tropical tasar silk displays higher mean, standard deviation, and coefficient of variation than that of temperate tasar silk. Although above and many such silk related articles (Ghose, 2001; Moon & Mitra, 2007; Sengupta et.al, 1998; Sreenivasa et.al, 2002) have been focused on structure-property relations, cocoon cooking and fabric property assessments, not much work have been reported on the improvement of quality aspects of the tasar silk yarns.

Weavers in major tasar clusters in India are in the practice of using Korean & Chinese tasar silk as warp and Indian tasar silk as weft since decades. With introduction of new machineries by CSTRI, Bangalore and CTR&TI, Ranchi, new phase of tasar silk yarn production with enhanced quality have begun. Multilocation field trials were conducted during January 2015 at four different locations to assess the performance of nine different reeling machines in tasar sector. Based on the field trials, tasar silk yarns produced on wet reeling machine, dry reeling machine, 2 step reeling cum twisting machine and unnati reeling machine have been recommended for use as warp during weaving. Major issue in tasar silk reeling is the sloughing-off of bunch of filaments from the cocoon during reeling process, which abruptly reduces the quality of reeled tasar yarn. In this study, efforts have been made to use two different types of slug catchers during tasar wet reeling process and assess its influence on the quality of the reeled tasar silk.

2. Materials and Methods

2.1 Materials