ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 7, Issue 1 , January 2020

Change of Qualitative characteristics of Fibers Produced from the Tark Mulberry Tree Branches

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ABSTRACT: This article investigated the physico-mechanical properties, rigidity and complete deformation of fibers from cotton, silk and wool fibers and mulberry tree bark.

KEY WORDS: Elemental fiber length, linear density, shear strength, linear density, viscosity, elasticity, frequency of screws, the degree of stiffness

I.INTRODUCTION

These mulberry horns were selected as the study objects because they were used more widely in the Republic of Uzbekistan.First, it was determined how many of the mulberry tree branches would remain after the leaves were sprouted from them. The research was done on newly cut mulberry tree branches [1].

In average 37% leaves were found on each branch. 63% of the leaves remain after they have been used as feed. The branches, in turn, are made up of wood and bark. Determination of their number shows that the bark of the horns isaveraged to 19.3%. The fiber in the mulberry horn lies in the bark, surrounded by pectin, parenchyma, cambium, epidermis and other tissues. The main substance of the fibrous cells is cellulose, which gives the fiber its strength and elasticity [2-3].

In order to separate the fiber, it is necessary to remove the adhesive material first and then wash it off. In our research, we clipped the mulberry tree branches in several variants and separated the fibers. This was done in the following order: the cut-off mulberry branches were clogged; the fiber was removed from the wooden part of the horn. The results showed that it took 28 days to remove the bark from the horn soaked in plain water [4].

Geometric properties of textile fibers and threads include their length and thickness. The length and thickness of the fiber directly affect the properties of the textile product. It is a necessary indicator for the use of yarn and threads. Length is an important indicator for fibers, since the spinning system is selected in relation to the length of the fibers [5].

II. METHODOLOGY

Elemental fiber length, linear density, shear strength, and elongation of the fibers isolated from the thick and thin branches of the mulberry tree are shown, and the results obtained are represented in Figures 1 and 2.

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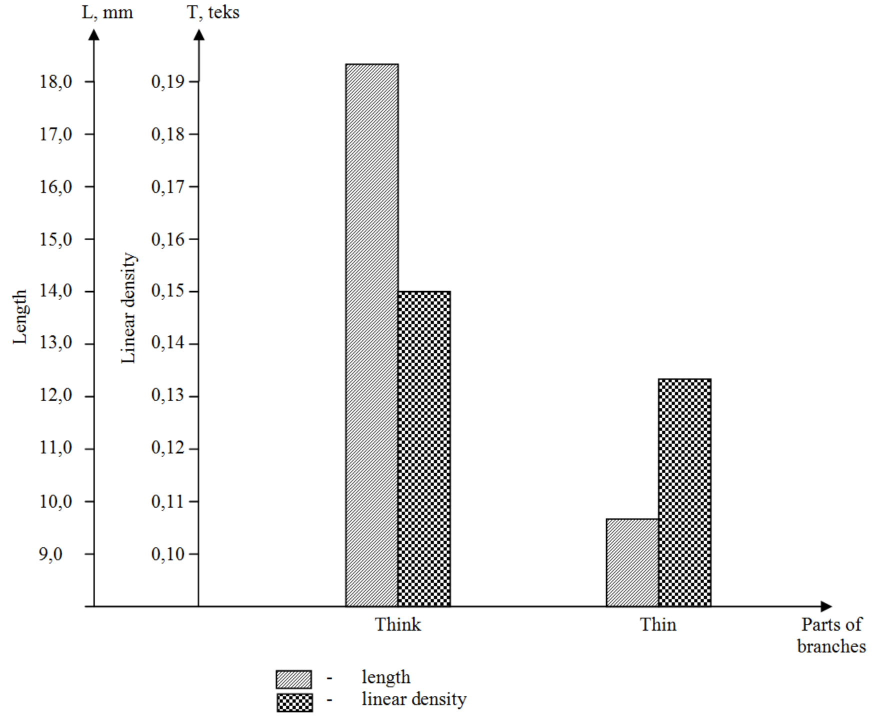

Fig. 1.Change in the quality indicators of fibers obtained from different parts.

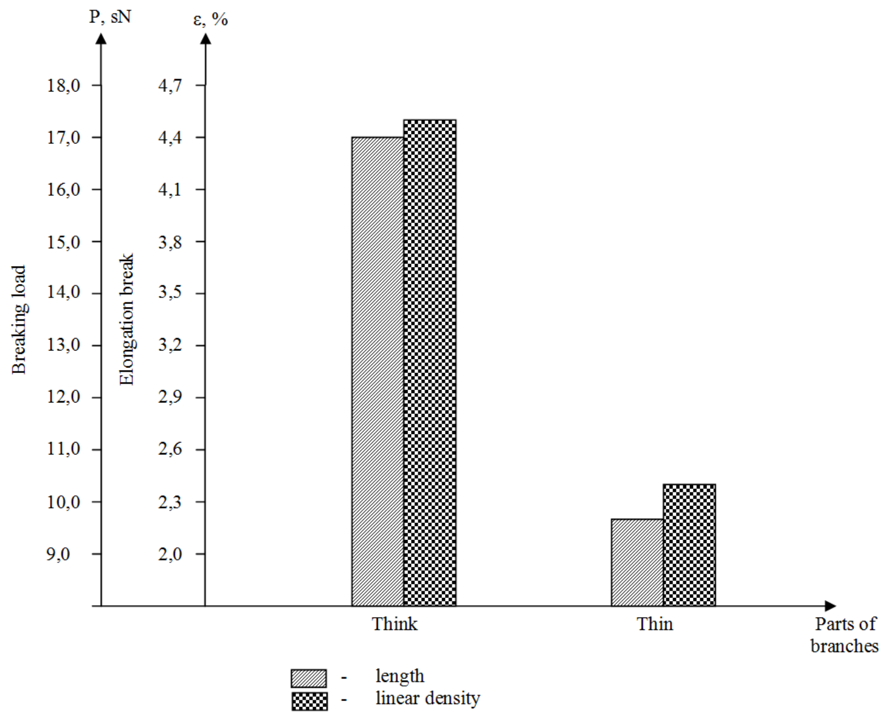

Fig.2.Change in breaking load and elongation of fibers obtained from different parts of the branch.

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III. RESULTS AND DISCUSSION

The results showed that the elemental fibers isolated from the thin branches of the mulberry tree were 3-15 mm in length, and 10-31 mm - from the thick branches of the mulberry tree. The linear density of the fibers was 0.12-0.18 tex.

The results of the study showed that in comparison to the indicators of fiber isolated from the thick branches of the mulberry tree, the length of the elemental fiber removed from the thin branches was 55.0%, the linear density was 18.7%, the fiber strength was 41.2%, and the fiber extension was 44, reduced by 4%.

One of the most important indicators is the flexibility of the textile fibers. Due to the increased fiber adhesiveness and the greater number of twisted sections, the yarn is stronger. It also reduces elasticity, fluffiness, volume, and heat transfer in relation to textile products.

Smooth fibers are not suitable for spinning, and the bonding between them is minimal. Crimpiness is characterized by the following parameters: the number of twists, the degree of folds, and the stability of the screws.The twisting of the fibers and threads is the wavy structure of the long axis of the fiber and the yarn.

Flexibility of the fibers and threads can be spatial and flat, sinusoidal. Fibers have a natural curvature. Torsion of synthetic fibers, textured yarn is formed by special processing in the manufacturing process to increase their viscosity, elasticity and volume.

One of the most important features of rolling stock. It is taken into account in the process of choosing a spinning system, processing high quality yarn and fabrics. The intensity of the bolts depends on the number and height of the screws per unit length [1].

Indicators of fibers are the frequency of screws “I”, the degree of curvature J and the tensile strength, as defined by GOST 13411-84.

The shear frequency and the number of waves per 1 cm of fiber and threads are calculated by Z:

$$I = \frac{Z \cdot 10}{L_0} \quad (1)$$

where: Z- is the number of waves in the measured particle; L-Initial length of loose fiber sample, mm.

The degree of stiffness is defined in% J with the elongated length of the fibers, with the ratio of the unweighted length of the strands:

$$J = \frac{(L_1 - L_2)}{L_0} 100 \quad (2)$$

where: L_1- length of straightened fiber or thread.

Tensile Stability is the degree of tensile strength of post-strength or deformed fibers, expressed as% of initial torsion strength:

$$Y_i = \frac{J_1}{J} 100 \quad (3)$$

where: J_1 - the degree of tortuosity after the application of force or deformation; J- initial tortuosity.

Flexibility of fiber or threads in J-initial position.

Fibers are of great importance, and the higher the stiffness of the fibers, the higher the elasticity of the yarn produced, and the output is thin, smooth and thin, and with a low degree of unevenness.

The degree of twisting is defined by the difference in% of corrected fibers and the length of the irregular fiber by extending the screws (Figure 3).

In the study, the diameter of the separated lubes was observed under a microscope, and the number of screws per 1 cm was determined.

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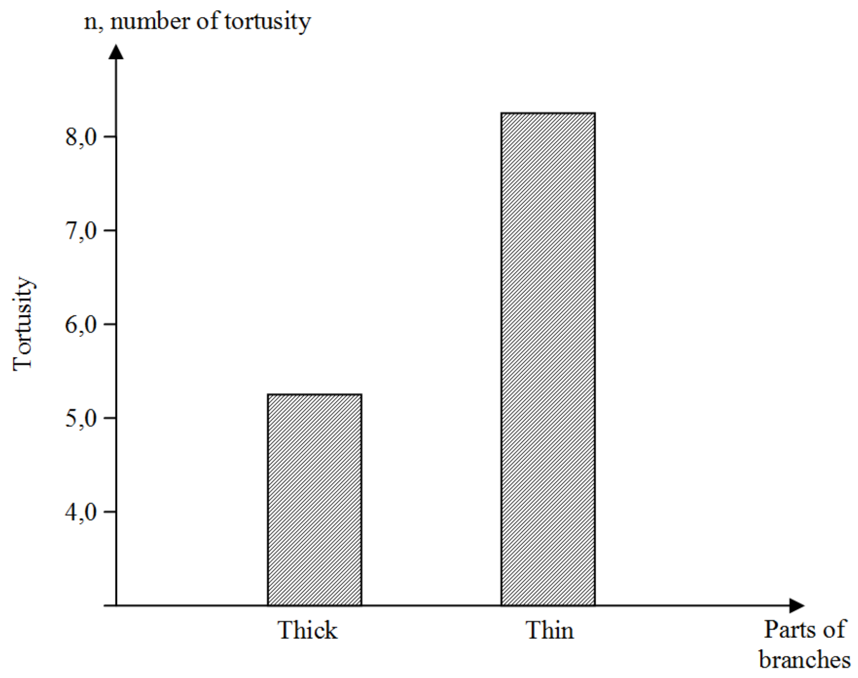

Fig.3.Change in the crimp of fibers obtained from different parts of a branch.

The results showed that the twisting of the fibers isolated from the thick horns was on average 4-6cm 1 cm and the flexibility of the fibers isolated from the thin branches was 7-8 screws per 1 cm. This indicates that the fiber elasticity is due to fatigue. Because the linear density of the fiber in the thick branches is 0.14-0.18 tex, the number of screws is 4-6, while the linear density of the fibers is 0.12-0.15 tex. formed the screws.

However, it is important to note that, although the thin branch of the tree is thinner and has a large number of screws, its length is less likely to form thin threads. In addition, the greater the number of threads in the fiber, the higher the elasticity, smoothness, and durability of the yarn.

The results showed that the linear density and number of threads of the fiber obtained from the thin branches of the mulberry tree was lower than that of the fiber from the thick branches of the mulberry tree. It follows that thin fibers can be extracted from the thin branches of the mulberry tree.

IV.CONCLUSION

Analysis of the results of the study shows that the thickness of the fiber received from the thin horn is 62.5% higher than the hardness of the fiber obtained from the thick branch of the mulberry tree.

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