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REARING OF SILKWORM, *BOMBYX MORI* L. ON DIFFERENT MULBERRY GENOTYPES AND ITS IMPACT ON POST COCOON PARAMETERS

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ABSTRACT

The current research study was conducted at Division of Sericulture Crop Improvement, College of Temperate Sericulture, Mirgund, SKUAST-Kashmir in spring seasons during 2019 and 2020. Three mulberry genotypes *viz.,* Kokuso-21, SKM-33 and Goshoerami were fed to silkworms from hatching upto spinning of cocoons and one control was also maintained for comparison. Among these tested mulberry genotypes, highest filament length (1166.670 m) and raw silk percentage (17.585 %) was recorded in Goshoerami fed silkworm batch. No significant difference was recorded for denier and renditta after silkworms were fed on these mulberry genotypes.

Keywords **:** Rearing, silkworm, mulberry, genotypes, post cocoon

Introduction

India has unique distinction of being the only country producing all the four known commercial silks, namely Mulberry, Tasar, Eri and Muga. In India Mulberry sericulture is practiced in the four traditional states *viz.,* Karnataka, Andhra Pradesh, West Bengal, Tamil Nadu and Union territory of Jammu and Kashmir. Silk is a natural protein fiber and is very soft, smooth, lustrous, strong and durable as compared to other natural and artificial fibres (Lamelu, 1998; and Craig and Riekel, 2002). Silk which is called "Queen of Textiles" is the most elegant textile in the world and provides livelihood opportunity to millions of people due to its high employment creation capacity, less capital investment and lucrative nature of its production. The nature of this industry is rural based with on-farm and off-farm activities having enormous employment generation potential thereby attracting the attention of the planners and policy makers to recognize this industry as one of the most appropriate avenues for socio-economic development of a largely agrarian economy of India. Sericulture industry provides employment to millions of persons in rural areas with low input cost in India. Of these, majority of the people belong to the economically weaker sections of society, including women. Besides silkworm rearing, the role of nutrition and selection of good mulberry varieties is very important for the successful expansion of the sericulture industry as it is the quality mulberry leaves which leads to healthy growth of silkworm larva and finally in the formation of good cocoon crop (Islam *et al.,* 2020a).

Materials and Methods

The research work was conducted at Division of Sericulture Crop Improvement College of Temperate Sericulture, Mirgund, SKUAST-Kashmir in spring seasons (2019 and 2020). Disease free layings of silkworm race namely PAM-117 was reared as per the standard rearing protocol (Anonymous, 2003). The rearing of silkworms was carried out on three mulberry genotypes namely Kokuso-21, SKM-33 and Goshoerami, besides one control was also maintained throughout rearing period for comparison. The 100 larvae/replication were maintained throughout the rearing period. The following parameters were recorded and calculated by the formulae:

Filament length (m)

It is the length of silk filament reeled from the cocoons. Ten cocoons were taken randomly from each treatment and reeled on an epprovette and total length of the filament was recorded and expressed into meters.

It was calculated by the formula:

$$\text{Filament length (m)} = \frac{\text{Total filament length (m)}}{\text{Total number of cocoons reeled}}$$

Raw silk percentage (%)

It is the percentage of quantity of raw silk reeled in reference to the fresh weight of cocoons utilized for reeling

It was calculated by the formula:

$$\text{Raw silk (\%)} = \frac{\text{Weight of silk reeled}}{\text{Cocoon weight}} \times 100$$

Denier

It indicates the thickness of silk filament and was calculated by the formula:

$$\text{Denier} = \frac{\text{Weight of silk reeled (g)}}{\text{Length of silk reeled (m)}} \times 9000$$

Renditta (kg)

It indicates the quantity of cocoons required to obtain one kilogram of raw silk and was calculated by the formula:

$$\text{Renditta (kg)} = \frac{\text{Weight of cocoons reeled}}{\text{Weight of raw silk obtained}}$$

Statistical analysis

The data was compiled, analyzed and significance was checked by using Anova table.

Results and Discussion

Significant difference in average filament length in silkworm fed with different mulberry genotypes was found, highest filament length (1166.67 m) was recorded in the silkworm batch fed with Goshoerami and lowest was recorded in SKM-33 (1005.67 m) (Table 1) (Fig. 1). Highest filament length may be due to the better shell weight reflecting in the better length of silk filament of cocoon. The total silk filament ranges from 600-1500 m and 80% of this is reliable (FAO, 1999). The current results are in line with Lalfelpui *et al.* (2014) who recorded highest silk filament of 1292 m in S1635 fed silkworms followed by V1 variety. The raw silk percentage showed significant difference after silkworms were fed with mulberry genotypes, highest (17.585 %) and lowest (16.857 %) was recorded in Goshoerami and SKM-33 fed silkworm batches respectively (Table 1) (Fig. 2). It is in agreement with Islam *et al.* (2020b) who recorded highest raw silk percentage of 19.92 % after double hybrid silkworms were fed on fortified egg albumen Goshoerami leaves in fifth instar. The denier of cocoons was found to be non significant after silkworms were fed on different mulberry genotypes. Furthermore, thinnest (2.405) and thickest (2.450) denier was recorded in Goshoerami and SKM-33 fed silkworm batches respectively (Table 1) (Fig. 2). The renditta also did not show any significant difference with regard to mulberry genotypes but comparatively lowest (6.380 kg) and highest (6.422 kg) renditta was recorded in Goshoerami and SKM-33 fed silkworm batches respectively (Table 1) (Fig. 2).

Table 1: Impact of different mulberry genotypes on reeling parameters of silkworm, *Bombyx mori* L.

Genotypes	Filament length (m)			Raw silk percentage (%)			Denier			Renditta (Kg)		
	Season (year)			Season (year)			Season (year)			Season (year)		
	Spring (2019)	Spring (2020)	Pooled	Spring (2019)	Spring (2020)	Pooled	Spring (2019)	Spring (2020)	Pooled	Spring (2019)	Spring (2020)	Pooled
Kokuso-21	1041.330^{b}	1068.330^{b}	1088.170^{b}	17.073^{c}	17.093^{c}	17.083^{c}	2.443	2.447	2.445	6.397	6.396	6.418
SKM-33	996.000^{b}	1015.330^{b}	1005.670^{c}	16.867^{d}	16.847^{d}	16.857^{d}	2.447	2.453	2.450	6.450	6.443	6.422
Goshoerami	1153.000^{a}	1180.330^{a}	1166.670^{a}	17.580^{a}	17.590^{a}	17.585^{a}	2.407	2.403	2.405	6.380	6.380	6.380
Control	1134.000^{a}	1141.000^{a}	1137.500^{ba}	17.217^{b}	17.217^{b}	17.217^{b}	2.413	2.423	2.418	6.393	6.393	6.395
CD (p≤ 0.05)	61.738	55.482	77.402	0.070	0.078	0.071	NS	NS	NS	NS	NS	NS

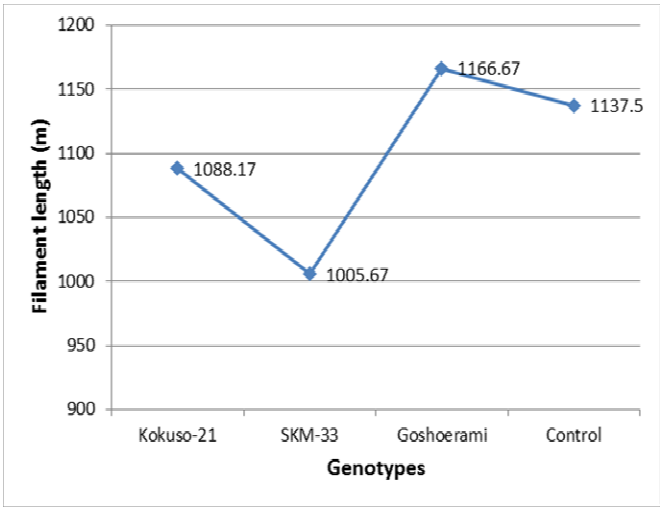

Fig. 1: Impact of different mulberry genotypes on average filament length of silkworm

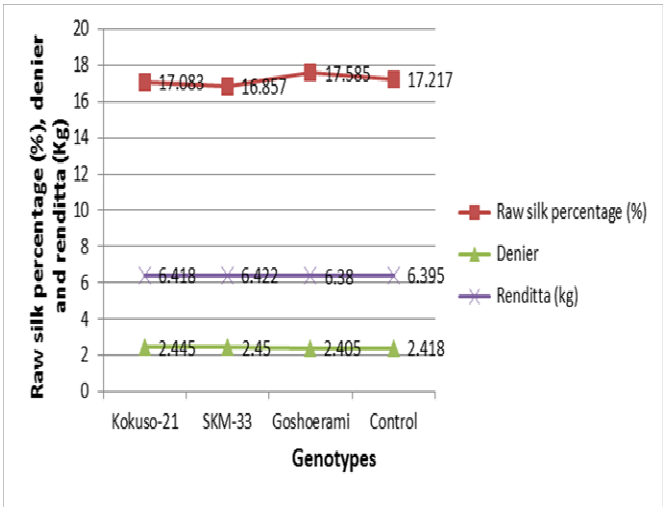

Fig. 2: Impact of different mulberry genotypes on raw silk percentage, denier and renditta of silkworm

Conclusion

The nutritional value of leaves of mulberry genotypes differs from each other and therefore selecting best mulberry plants is very important for healthy growth and development of silkworm larva and finally in the formation of good quality cocoons. The current results showed that Goshoerami genotype fed silkworms recorded significantly highest filament length and raw silk percentage as compared to control. The other reeling parameters like denier and renditta showed non significant difference after silkworms were fed on these mulberry genotypes. From the above research findings Goshoerami genotype can be recommended to rearers for the rearing of silkworms and successful formation of good cocoon crop.

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