

## **Evaluation of mulberry cultivars for growth and development of different breeds of *Bombyx mori* L.**

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### **ABSTRACT**

The experiment was conducted in Silkworm Rearing Laboratory, Entomology Section, College of Agriculture, Nagpur during December 2003 to January 2004 in Factorial Completely Randomized Design with three replications and seven treatments *viz.*, Sujanpuri, S-54, S-41, BER-1, BER-776, BER-763 and Kanva-2. Silkworm breeds CSR<sub>4</sub> x CSR<sub>2</sub> and PM x CSR<sub>2</sub> were used. The maximum larval weight was observed when larvae fed with cultivar S-54 (38.71 g L<sup>-10</sup>) followed by Kanva-2 (38.54 g L<sup>-10</sup>). Larval duration was minimum when fed with S-54 and Kanva-2 cultivars which recorded (30.33 days). The maximum silk percentage was recorded with the treatment S-54 (23.92%) followed by Kanva-2 (21.22 %) while the maximum filament length was found in silkworm reared on Kanva-2 (907.83 m C<sup>-1</sup>) followed by S-54 (897.63 m C<sup>-1</sup>).

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Silk is often called the “Queen of fibres of textile” and occupies a prestigious place among all fibres. It has soft feel, smoothness, strength and aesthetic value. The sericulture industry is gradually developing in Vidarbha region. The success of sericulture depends on the supply of quality leaves from high yielding mulberry varieties and availability of high cocoon yielding silkworm races/hybrids during different weather conditions prevailing in the region. The silkworm (*Bombyx mori* L.) derives all the nutritional requirements for its growth and development from mulberry, *Morus* spp. the exclusive food plant.

Mulberry cultivars have significant effect on quality and quantity production of silk. The mulberry varieties advocated and silkworm breeds made available for Vidarbha region are not exactly known to be suitable for this region. Therefore, the present study was undertaken to identify the mulberry varieties suitable to the soil and climate of Vidarbha.

### **MATERIALS AND METHODS**

The experiment was conducted in Silkworm Rearing Laboratory, College of Agriculture, Nagpur during December, 2003 to January, 2004 in Factorial Completely Randomized Design with three replications. Seven mulberry cultivars *viz.*, Sujanpuri, S-54, S-41, BER-1, BER-776, BER-763 and Kanva-2 were selected for feeding their leaves to silkworm larvae. Two silkworm breeds *viz.*, CSR<sub>4</sub> x CSR<sub>2</sub> and PM x CSR<sub>2</sub> were produced for the experiment. When eyespot was observed on the DFLs, the eggs were black boxed and exposed to light on probable date of hatching. Hatched worms were transferred to plastic trays lined with paraffin paper. Initially the worms were fed with Kanva-2 cultivar upto

first moulting. After completion of first moulting, for each treatment fifty instar larvae were sampled out for each breed and fed with the leaves of different fresh second mulberry cultivars as per treatments for three replications. Thus, 21 trays per breed were prepared for each silkworm breed. These larvae were fed with respective test cultivars four times daily *i.e.* 7 am, 11.30 am, 4 pm and 8.30 pm and observations on larval weight and larval duration were recorded. The completely matured larvae were transferred on the mountages for spinning of cocoons. The observations on the silk percentage and filament length were recorded 6<sup>th</sup> day after spinning of the cocoons.

### **RESULTS AND DISCUSSION**

From Table 1, it is revealed that, the average weight of 10 full grown larvae was maximum when larvae fed with cultivar S-54 (38.71 g L<sup>-10</sup>) followed by Kanva-2 (38.54 g L<sup>-10</sup>). Amongst the silkworm breeds, CSR<sub>4</sub> x CSR<sub>2</sub> was recorded higher larval weight (37.08 g L<sup>-10</sup>) than PM x CSR<sub>2</sub> (31.13 g L<sup>-10</sup>). The interaction effect of silkworm breeds and mulberry cultivars revealed that, the best combinations was the breed CSR<sub>4</sub> x CSR<sub>2</sub> reared on cultivar S-54 (43.42 g L<sup>-10</sup>) followed by same breed reared on Kanva-2 (42.23 g L<sup>-10</sup>). Silkworm breeds reared on cultivars S-54 and Kanva-2 recorded the minimum larval development period (30.33 days). Amongst the breeds, PM x CSR<sub>2</sub> recorded lower larval developmental period (30.61 days) than CSR<sub>4</sub> x CSR<sub>2</sub> (31.42 days). The best combination was the breed PM x CSR<sub>2</sub> reared on Kanva-2 followed by same breed reared on S-54. Anonymous (1983) and Tayade *et al.* (1988) also reported that the cultivar S-54 was superior in case of larval weight and larval developmental period.

**Table 1: Effect of mulberry cultivars on larval weight and duration**

Mulberry cultivars	Av. Weight of 10 full grown larvae (g)			Av. larval developmental period (Days)		
	CSR <sub>4</sub> x CSR <sub>2</sub>	PM x CSR <sub>2</sub>	Mean	CSR <sub>4</sub> x CSR <sub>2</sub>	PM x CSR <sub>2</sub>	Mean
Sujanpuri	31.34	27.54	29.44	31.33	31.00	31.16
S-54	43.42	34.00	38.71	30.66	30.00	30.33
S-41	38.15	31.53	34.84	31.33	31.00	31.16
BER-1	34.58	30.22	32.40	31.33	31.00	31.16
BER-776	32.02	28.34	30.18	32.00	31.33	31.66
BER-763	37.84	31.48	34.66	32.33	30.33	31.33
Kanva-2	42.23	34.85	38.54	31.00	29.66	30.33
Mean	37.08	31.13		31.42	30.61	
	Silkworm breeds	Mulberry cultivars	Silkworm Breeds x mulberry cultivars	Silkworm breeds	Mulberry cultivars	Silkworm Breeds x mulberry cultivars
S.E. ±	0.012	0.023	0.033	0.09	0.17	0.24
C.D. (P=0.05)	0.035	0.067	0.096	0.26	0.49	0.71

**Table 2: Effect of mulberry cultivars on silk percentage and filament length per cocoon**

Mulberry cultivars	Av. silk percentage (%)			Av. filament length per cocoon (m)		
	CSR <sub>4</sub> x CSR <sub>2</sub>	PM x CSR <sub>2</sub>	Mean	CSR <sub>4</sub> x CSR <sub>2</sub>	PM x CSR <sub>2</sub>	Mean
Sujanpuri	21.76	18.07	19.91	972.76	657.60	815.18
S-54	25.88	21.97	23.92	1038.93	756.33	897.63
S-41	20.04	15.10	17.57	1052.63	736.10	894.36
BER-1	21.86	18.04	19.95	1045.23	581.10	813.16
BER-776	21.02	16.99	19.00	1010.00	655.26	832.63
BER-763	20.71	17.47	19.09	978.06	712.06	845.06
Kanva-2	21.63	20.82	21.22	1090.70	724.96	907.83
Mean	21.85	18.35		1026.90	689.06	
	Silkworm breeds	Mulberry cultivars	Silkworm Breeds x mulberry cultivars	Silkworm breeds	Mulberry cultivars	Silkworm Breeds x mulberry cultivars
S.E. ±	0.079	0.14	0.20	2.20	4.12	5.83
C.D. (P=0.05)	0.22	0.43	0.60	6.40	12.00	16.97

From Table 2, it is revealed that the silkworm breeds reared on cultivar S-54 recorded highest silk percentage (23.92 %) followed by Kanva-2 (21.22 %). Amongst silkworm breeds, CSR<sub>4</sub> x CSR<sub>2</sub> was observed more silk percentage (21.85 %) over PM x CSR<sub>2</sub> (18.35%). The best combination of silkworm breed and mulberry cultivars was CSR<sub>4</sub> x CSR<sub>2</sub> reared on S-54 (25.88 %). Thangmani and Vivekanandan (1984) also reported that the cultivar S-54 showed higher silk percentage.

The maximum filament length was found in silkworm reared on Kanva-2 (907.83 m C<sup>-1</sup>) followed by S-54. The silkworm breed CSR<sub>4</sub> x CSR<sub>2</sub> recorded higher filament length (1026.90 m C<sup>-1</sup>) than PM x CSR<sub>2</sub> (689.06 m C<sup>-1</sup>). The combination of the breed CSR<sub>4</sub> x CSR<sub>2</sub> with the cultivar Kanva-2 proved the best (1090.70 m C<sup>-1</sup>) followed by same breed reared on S-41 (1052.63 m C<sup>-1</sup>). Nangia and Nareshchandra (1990) also recorded maximum silk filament length by feeding Kanva-2 mulberry cultivar.

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