

PERFORMANCE OF SIX SILKWORM VARIETIES AT PESHAWAR

MOHAMMAD IQBAL*
MOHAMMAD SHAHID*

Abstract

Economic characters of six silkworm varieties, namely, Jam x Jam 108, Taihei x Choan, Banei x Hoka, Shuko x Ryuhaku, North Korean and a local variety were studied for spring rearing at Peshawar and overall performance of Taihei x Choan was found superior.

Introduction

Silkworm rearing is a popular agro-based cottage industry in many parts of our country. According to Rao and Yamatani (1979) about 40,000 boxes of silk-seed are distributed every year for spring rearing out of which about 15,000 boxes are produced in local grainage centres and remaining seed is imported from sericulturally advanced countries like Korea and Japan. As quality of silk-seed used in rearing plays pivotal role in quality and yield of cocoons and raw silk, the present study was conducted to determine and evaluate performance of silk-seed obtained from different sources.

Yokotama (1961) mentioned that a pure-bred cocoon weighed 1.5 to 1.8 grams and hybrid cocoon weighed 2.0 to 2.5 grams. Metcalf *et al* (1962) reported that weight of cocoon varied between 0.4 to 2.0 grams. Choe (1973) observed that cocoon size varied between 90 to 110 cocoons per litre depending upon variety, rearing season and harvesting conditions and cocoon shell percentage ranged between 18 to 22 percent in spring cocoons and 16 to 20 percent in summer-autumn ones.

Muslim (1977) tested a Korean variety, namely, Jam 103 x Jam 104 for autumn rearing at Lahore and recorded following characteristics:

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| (i) | Larvel duration: | |
| (a) | Fifth instar. | 8 days. |
| (b) | Whole life. | 25 days. |
| (ii) | Survival rate. | 86 percent |
| (iii) | Double cocoons. | 1 per cent |
| (iv) | Single cocoon weight. | 1.84 gm. |
| (v) | Cocoon shell weight. | 0.37 gm. |
| (vi) | Cocoon shell ratio. | 20 per cent. |

The Korean Silkworm Eggs Association (1976) evaluated performance of nine silkworm

* Authors are Assistant Conservator of Forests, NWFP Forest Department and Professor, Department of Entomology, University of Peshawar, respectively.

varieties out of which economic characters of one of the varieties related to present study, namely, Jam 107 x Jam 108 are reproduced below:

(i)	Larval duration:	
(a)	Whole larval stage.	24.03 days.
(b)	Fifth instar.	7.19 days.
(ii)	Pupation ratio.	93.0 percent.
(iii)	Cocoon yield.	22.0 Kg.
(iv)	Double cocoon ratio.	3.7 percent.
(v)	Number of cocoons per litre.	58
(vi)	Weight of a cocoon.	2.51 grams.
(vii)	Weight of a cocoon shell.	61.0 cg.
(viii)	Cocoon shell ratio	24.3 percent.
(ix)	Raw silk percentage.	21.43
(x)	Raw silk production by 10,000 of 3rd moulted larvae.	4.71 kg.

Materials and methods

Silk-seed of the following six varieties was used in the study:

(i)	Jam 107 x Jam 108	(South Korea)
(ii)	Taihei x Choan	(Japan)
(iii)	Banei x Hoka	(Japan)
(iv)	Shuko x Ryuhaku	(Japan)
(v)	North Korean variety	(North Korea)
(vi)	Local variety.	(Azad Kashmir)

The seed was kept for incubation in the incubation room of Sericulture Development Centre, Peshawar on 3rd March 1981 in completely randomised design replicated four times. Each replication consisted of half a gram of Silk-seed of the six test varieties. Eggs in each lot were counted and placed for incubation in incubation cases. Daily record of hatching was maintained separately for each batch of eggs.

One hundred larvae of uniform age were gently separated from each batch and were kept in separate rearing trays. The trays were properly labelled and shifted to rearing room where they were reared under uniform conditions. Mature larvae were allowed to spin cocoons on wheat straw and the cocoons were harvested five days after spinning. Reeling was done on indigenous hand reeling machine and cocoons of each lot were reeled by the same reeler. Characters of economic importance like total and useful hatchability, larval duration, survival percentage of larvae, cocoon yield, single cocoon weight, cocoon shell weight, cocoon shell ratio, double cocoon ratio, number of cocoons per litre, yield of raw silk, yield of silk-waste and gum percentage were studied.

Temperature and relative humidity of the incubation and rearing rooms were kept within

optimum limits as far as possible, by using electric heater and steaming. Daily record of temperature and relative humidity was maintained at 8.00 a.m., 12.00 noon and 4.00 p.m.

Results and discussion

Result of relative performance of the test varieties are given in the table. Perusal of the data given in the table indicate that none of the test varieties proved superior in all the characters investigated during the experiment. However, keeping in view the characters desired by the reelers, the North Korean variety stood distinct because of its highest total and useful hatchability, maximum survival percentage of larvae, largest size of cocoons and above all the highest yield of green and dry cocoons. However, yield of raw silk of this variety was lower than that of Taihei x Choan. The latter variety had also higher useful hatchability in eggs, lesser duration of larval stage and fifth instar, more cocoon shell weight and cocoon shell ratio and lesser percentage of double cocoons as compared to North Korean variety. Therefore, over-all performance of Taihei x Choan variety was found to be superior to the rest of varieties and was recommended for spring rearing in the area.

Overall performance of local variety was very poor particularly in total and useful hatchability of eggs, weight and size of cocoons, weight of cocoon shell and yield of rawsilk. However, its cocoon yield was slightly better than that of Banei x Hoka variety. Poor performance of local variety was mainly attributable to lack of hybrid vigour in it.

TABLE: RELATIVE PERFORMANCE OF THE TEST VARIETIES OF SILKWORM DURING SPRING REARING AT PESHAWAR

S.No.	Characters.	Replication means*						
		Jam 107 x Jam 108	Taihei x Choan	Banei x Hoka	Shuko x Ryuhaku	North Korean variety	Local variety	
1	2	3	4	5	6	7	8	
(i)	Hatchability (%)							
	(a) Total.	89.7 A	92.8 A	91.2 A	90.1 A	95.7 A	64.1 B	
	(b) Useful.	89.7 A	92.8 A	91.2 A	90.1 A	89.1 A	59.1 B	
(ii)	Larval duration (days):							
	(a) Whole instar.	30.07 A	29.08 A	29.00 AB	29.05 B	30.02 A	29.03 B	
	(b) Fifth instar.	7.00 A	5.99 B	6.02 B	6.01 B	6.98 A	6.06 B	
(iii)	Survival percentage of larvae.	79.75 A	89.00 A	82.75 A	84.25 A	91.00 A	89.50 A	
(iv)	Cocoon yield per 100 larvae (including double cocoons):							
	(a) Green (grams).	186.4 B	179.9 B	153.7 C	174.2 BC	210.5 A	166.2 C	
	(b) Dry (grams).	72.4 B	70.5 B	59.7 C	67.6 BC	81.9 A	64.5 BC	
(v)	Single cocoon weight (grams).	2.29 A	1.94 B	1.88 B	2.03 AB	2.24 A	1.87 B	
(vi)	Cocoon shell weight (grams).	0.52 A	0.51 AB	0.48 B	0.53 A	0.50 AB	0.43 C	
(vii)	Cocoon shell ratio (%).	22.81 A	25.11 A	25.46 A	26.09 A	22.43 A	23.35 A	
(viii)	Double cocoon ratio (%).	9.75 A	3.77 BC	2.47 BC	4.65 BC	5.65 AB	0.75 C	
(ix)	Number of cocoons per litre.	70.00 BC	73.75 B	72.50 B	74.25 B	66.25 C	83.00 A	
(x)	Yield of raw silk:							
	(a) Quantity (grams).	18.57 B	22.35 A	19.30 B	19.92 AB	20.47 AB	18.07 B	
	(b) Percentage.	28.42	32.95	33.15	30.90	26.49	28.02	
(xi)	Yield of silk waste (grams).	8.72 A	10.02 A	7.72 A	9.55 A	11.52 A	9.37 A	
(xii)	Basinary cocoons obtained during reeling process and gum contents:							
	(a) Quantity of basinary cocoons (grams).	32.05 B	28.98 BC	25.08 B	28.79 C	38.15 A	30.46 BC	
	(b) Gum contents (grams).	6.01 A	6.49 A	5.12 A	6.20 A	7.13 A	6.60 A	
	(c) Gum percentage.	9.19	9.57	10.51	9.62	9.23	10.23	

*Means shown with same letters are not significantly different from one another.

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