

Impact Assessment of Homeopathic Drugs Iodium and Lachesis on Larvae, Cocoon and Post-Cocoon Characteristic of *Bombyx Mori L.*

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Abstract: *In the present investigation the Fifth instar Silkworm larvae, Bombyx mori L. were fed on the mulberry leaves fortified with Homoeopathic drug Iodium 30X and Lachesis 30X potencies with two different concentrations i.e. 1:4 and 1:8 ratios @ 2 ml per feed. The impact of treatments on larval weight, cocoon weight, shell weight and pupal weight, silk ratio, larval mortality, average filament length and weight, denier of filament and number of breakages during reeling were studied.*

The study showed that, there was a positive impact on the biological characteristics of Bombyx mori L. larvae fed on mulberry leaves with Iodium 30X and the treatment is beneficial; while with Lachesis 30X shows negative impact on some of the cocoon and post cocoon characteristics of Bombyx mori L. The present study is definitely helpful for the sericulture industry and in turn to improve the economic status of the Sericulturists.

Keywords: *Mulberry leaves, Bombyx mori, Fortification, Homoeopathic drug, Rearing performance, Larval and post-Cocoon characters.*

1. INTRODUCTION

Silkworm *Bombyx mori L.* was selected for comprehensive research studies because of the fact that the rearing of this insect for production of natural silk is a labour-intensive, welfare-oriented, village-based cottage industry, capable to stem the migration of people from the village to the cities. It provides employment and helps in ameliorating the socio-economic status of rural folks. "Natural Silk" a dry salivary secretion, is produced when a full grown silkworm larva spins its cocoon during pre-pupation. It is known as the "Golden Fibre" of the "Golden Queen" of textile and is admired all over the world for its sleek and lust. Its products are wonderfully light and soft but strong and smooth and universally accepted by the world top fashion designers for its elegance, colours dyeing affinity, thermo tolerance and water absorbance.

Mulberry, *Morus alba L.* is the sole food plant for silkworm, *Bombyx mori L.* and is grown under varied climatic conditions ranging from temperate to tropical. Mulberry leaf is a major economic component in sericulture since the quality and quantity of leaf produced per unit area have a direct bearing on cocoon harvest [1].

The supplementation or fortification of mulberry leaves is recent technique in sericulture research [2 and 3]. The dietary nutritional management influences directly the quality and quantity of silk production [4, 5, 6 and 7]. Nutrition is an important growth-regulating factor in silkworm larvae and with this Background, the study investigated the growth of silkworm larvae fed on mulberry leaves enhanced with Iodium (30X) and Lachesis (30X) on the cocoon and post cocoon characteristics.

2. MATERIALS AND METHODS

Experimental details

- Design : Completely Randomized Design (CRD)
- No. of replication : 4
- Mulberry variety : V1
- Number of treatments : 4
- Control group : 2

Control = without fortification

Experimental control = Distilled water

T1 = Iodium 30X (1:4),

T2 = Iodium 30X (1:8),

T3 = Lachesis 30X (1:4),

T4 = Lachesis 30X (1:8).

Fresh disease free eggs of *Bombyx mori*. L (Race: PM ×CSR2) were obtained from the State Sericulture Department, Aurangabad District; Maharashtra, India and incubated, brushing was done and reared on field up to cocoon stage at temperature range 25-29°C with humidity range 72-85% during Winter season 2009. It was used for evolution of effect of above drugs on biological characters of silkworm.

The experiment was conducted by taking randomly just 4th moult passed i.e.5th instar larvae in three groups. For each group i.e. one control and two experiments 50 Larvae were taken in two replicates. All the groups were exposing to the trial under same environmental condition. All the rearing operations were carried out according to [8 and 9].

For fortification drugs Iodium 30X and Lachesis 30X were procured from local Central Homeopathic Pharmacy Shop, Dalalwadi. Aurangabad, M.S. India. The test solutions were prepared by using 10 ml of drug with 40 ml of distilled water and 10 ml of drug with 80 ml of distilled water was used as stock solution, kept in refrigerator. The quantity of feed given to the all groups with 40 g of matured mulberry chopped leaves for each feed and 4 feedings per day were provided. One group was kept control giving the first feeding by using non treated only distilled water but the experimental group was given first feed sprinkled, mixed with the 2 ml of test solution till the larvae went on spinning.

Evaluation was based on mature larval weight, cocoon weight, pupal weight, shell weight, pupal weight, silk ratio, average filament length, average weight of filament, average denier of filament and number of breakages during reeling and it was carried out on randomly selected samples. The values were compared between experimental and control groups in terms of percent change over control.

3. RESULTS AND DISCUSSION

Iodium 30X (1:4) treatment in all values measured shows positive values larval weight 2.392 (20.20 and 8.529 %), pupal weight 1.106(5.635 and 0.912%), cocoon weight 1.390 (14.12 and 6.26 %), shell weight 0.208 (67.06 and 46.39 %), silk ratio 20.44 (11.83 and -3.368%), filament weight 0.156 (23.80 and 12.40 %), Filament length 514.2 (12.83 and 7.73 %) and denier 2.797 (12.15 and 18.71 %) of filament compared to the control and experimental control group. Iodium 30X (1:8) treatment in all values measured shows positive values larval weight 2.578 (29.54 and 16.96 %), pupal weight 1.104(5.44 and 0.729 %), cocoon weight 1.379 (13.21 and 5.187 %), shell weight 0.208 (79.41 and 57.21%), silk ratio 21.68 (53.64 and 46.62%), filament weight 0.166 (29.09 and 33.87 %), Filament length 527 (15.64 and 10.41 %) and denier 2.760 (10.66 and 17.41 %) of filament in the experimental group compared to the control and experimental control group.

Lachesis 30X (1:4) dilution shows decreases pupal weight 1.001 (-4.39 and -8.66%), cocoon weight 1.478 (-5.829 and -12.50 %), shell weight 0.145 (-14.70 and -25.25 %), shell ratio 13.06 (-

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7.44 and -11.67 %), filament weight 0.117(-7.143 and -5.64 %) and denier 2.262 (-9.302 and -3.989 %) and increase in larval weight 2.213 (11.05 and 0.272 %), filament length 460.5 (1.053 and -3.518 %). From this it is clear that major reading of parameter shows adverse impact on silkworm *Bombyx mori* L. Lachesis 30X (1:8) dilution shows decrease larval weight 1.900 (-4.522 and -13.79 %), shell weight 0.163 (-4.11 and -15.98 %), shell ratio 12.96 (-8.15 and -12.34 %), filament weight 0.112(-11.11 and -9.677 %) and denier 2.213 (-11.26 and -13.70 %) and increase in pupal weight 1.094 (4.489 and -0.182 %), cocoon weight 1.257 (3.20 and -4.118 %) and filament length 457.6 (0.417 and -4.127 %). From this it concluded that here also some parameter shows adverse impact on silkworm.

Table1. Effect of Drugs Iodum 30X and Lachesis 30X on biological character of silkworm, *Bombyx mori* and Cocoon parameter.

Sr. No.	Characters	Control	Expt. control	Treatments				% over control				% over Expt. control			
				T1	T2	T3	T4	T1	T2	T3	T4	T1	T2	T3	T4
1.	Larval weight (g)	1.99	2.204	2.392	2.578	2.21	1.90	20.20	29.54	11.05	-4.522	8.529	16.96	0.272	-13.79
2.	Cocoon weight (g)	1.218	1.311	1.390	1.379	1.147	1.257	14.12	13.21	-5.829	3.201	6.26	5.187	-12.50	-4.118
3.	Shell weight (g)	0.170	0.194	0.284	0.305	0.145	0.163	67.06	79.41	-14.70	-4.11	46.39	57.21	-25.25	-15.98
4.	Pupal weight (g)	1.047	1.096	1.106	1.104	1.001	1.094	5.635	5.44	-4.39	4.489	0.912	0.729	-8.667	-0.182
5.	Silk ratio (%)	14.11	14.786	20.44	21.68	13.06	12.96	44.86	53.64	-7.44	-8.15	38.23	46.62	-11.67	-12.34
6.	Filament length (m)	455.7	477.3	514.2	527	460.5	457.6	12.83	15.64	1.053	0.417	7.730	10.41	-3.518	-4.127
7.	Filament weight (g)	0.126	0.124	0.156	0.166	0.117	0.112	23.80	24.09	-7.143	-11.11	12.40	33.87	-5.64	-9.677
8.	Denier	2.494	2.356	2.797	2.76	2.262	2.213	12.15	10.66	-9.302	-11.26	18.71	17.41	-3.989	-13.70
9.	No. of Breakage	02	02	01	01	03	02	-50	-50	33.33	00	-50	-50	-33.33	00
10.	Mortality	05	03	01	01	07	05	-80	-80	40	00	-66.66	-66.66	133.33	66.66

Hiware^[10] shows that increased larval weight, shell weight, silk ratio, filament length, average filament Weight and average denier of filament and number of breakages due to *Nux vomica* drug. The present investigation also co-related with S. Kamalakannani et al^[11] shows that efficacy of two drugs Supradyn and Spirulina solution on growth efficiency, fortified agent not only increased the growth of silkworm but also enhanced the reproductive efficiency and silk productivity. Hiware^[12] also shows effect of fortification of mulberry leaves with homeopathic drug Chelidonium MT impact on various biological parameter of silkworm *Bombyx mori* L. The results were positive in all parameters except cocoon weight and pupal weight which is comparatively correlated with our work.

Luciano Cappallozza et al^[13] show that when complete L-ascorbic acid deprivation is done during the larval cycle, it affects larval growth and cocoon production. Furthermore, L- ascorbic acid absence from larval food, particularly during the first and last instars, beneficial effects to cocoon production without affecting the survival rate or delaying the larval cycle. Etebari^[14] showed that the high concentration of nicotinamide (10, 20, 30 g/l) could cause intensive mortality in the larval stage. From the first instar, the larvae in this group were treated with high doses. None of the larvae from the 20 and 30 g/l concentration entered the 5th instar. It also shows that maximum larval weight in concentrations of 5, 10, 20 and 30 g/l are 139.5 (5th instar), 100.7 (5th instar), 30.3 (4th instar) and 28.2 (4th instar) mg respectively. Not only did the silkworm larvae fed high doses of vitamin C not show any increase in cocoon characteristics, but 5% decrease in weight was observed in female cocoons, the males were able to tolerate the hypervitaminosis [15].

Remadevi et al^[16] also show that the effect of topical and oral application of kinetin (6-Furfuryl Amino Purine) on the larval growth and other economic characters of mulberry silkworm *Bombyx mori* L. They show that except for an increase of shell weight in treatment of 0.2 ppm at 24 hours, oral application of kinetin did not alter any of the economic traits. In the silkworm, Saha and Khan^[17] described the extensive effects of multi-vitamin compound as diet factors in growth interruption and decrease in cocoon characteristics. All of these results show adverse impact on silkworm which is correlate with our findings.

From all of this it is clear that Iodum30X shows positive impact on larval and post cocoon character as compare to both control and experimental control. Likewise Lachesis 30X Potency dilutions shows highly adverse impact on larval as well as post cocoon parameter of silkworm. The results under study shows that Lachesis 30X (1:4) dilutions decreases all the parameters

except larval weight, cocoon weight and filament length. Lachesis 30X (1:8) dilutions decreases all the parameters except cocoon and filament length.

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