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Effect of plant growth regulators and supplement treated mulberry on economic traits of mulberry silkworm (*Bombyx mori* L.)

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Abstract
The present investigation entitled "Effect of Plant Growth Regulators and Supplement Treated Mulberry on Economic Traits of Mulberry Silkworm (*Bombyx mori* L.)" was conducted during 2024-25 at the Sericulture Research Unit, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, to evaluate the impact of plant growth regulators and supplements on cocoon quality and silk productivity. The experiment was laid out in a completely randomized design with ten treatments and three replications, using bivoltine race $FC_2 \times FC_1$ reared on mulberry variety V1. Among the treatments, Seriboost @ 7 ml/L (T_3) recorded the highest single cocoon weight (1.70 g), shell weight (0.37 g), shell ratio (21.81%), longest filament length (980 m), and maximum filament weight (0.28 g), while the control (T_{10}) showed the lowest values with single cocoon weight (1.50 g), shell weight (0.31 g), shell ratio (20.62%), filament length (800 m), and filament weight (0.21 g). GA_3 @ 50 ppm (T_7) exhibited the highest silk yield (18.77 kg) with a denier value of 2.71, whereas the control registered the lowest silk yield (14.66 kg) with a denier of 2.55. These findings clearly demonstrate that plant growth regulators and supplements significantly enhanced economic traits of mulberry silkworm, with Seriboost @ 7 ml/L proving most effective for cocoon quality improvement, while GA_3 @ 50 ppm excelled in silk yield.

Keywords: Plant growth regulators, suppliment, *Bombyx mori* L, Seriboost

Introduction

Sericulture, the practice of rearing silkworms for silk production, is a significant agro-based industry with economic, social, and environmental relevance. India, the second-largest silk producer globally after China, contributes around 18% of global silk output and is unique in producing all four commercial silk types: mulberry, tasar, eri, and muga. Among these, mulberry silk dominates with approximately 70% share (Ekka & Bais, 2023) [6]. The industry supports over 9 million people, primarily in rural and semi-urban areas, fostering rural employment, women's empowerment, and sustainable livelihoods.

As a labour-intensive, low-investment activity, sericulture is ideal for small-scale farmers, artisans, and entrepreneurs. States like Karnataka, Andhra Pradesh, Tamil Nadu, and Assam lead in silk production, while non-traditional states such as Maharashtra known for bivoltine sericulture are emerging as significant contributors (Hiware, 2016; CSB, 2023) [9, 3].

The mulberry silkworm (*Bombyx mori* L.) is monophagous, feeding exclusively on *Morus* spp. leaves, which directly influence larval development, cocoon yield, and silk quality (Bongale *et al*., 1997; Rathod *et al*., 2015) [2, 25]. Adequate nutrition during larval stages particularly the last two, which account for 80-85% of total leaf intake is critical for silk productivity. Studies indicate that nutrient supplementation, including vitamins like folic acid and B-complex, can enhance larval health, body weight, and resistance to environmental stress (Das & Medda, 1998) [4].

To improve mulberry leaf yield and quality, plant growth regulators (PGRs) such as auxins, gibberellins, cytokinins, and newer hormones like brassinosteroids are used. These compounds influence plant physiology, enhance sprouting, and contribute to better leaf biomass, especially under variable environmental conditions (Geetha & Murugan, 2017) [7]. Biofertilizers like PGPR and vermicompost also support plant growth and disease resistance.

Previous research has shown that feeding silkworms with hormone-treated mulberry leaves or applying hormones topically can significantly improve growth and cocoon parameters (Kamada & Ito, 1984; Magadum & Hooli, 1989, 1990) [11, 15, 16]. Despite this, comprehensive data on the effects of PGRs on economic traits of silkworms remain limited.

Given the direct relationship between larval nutrition and cocoon quality (Legay, 1958) [14], this study aims to evaluate the impact of plant growth regulators and supplements on the growth and development of *Bombyx mori* L., with a focus on larval weight and cocoon characteristics.

2. Materials and Methods

2.1 Experimental Site and Design

The experiment entitled "Effect of Plant Growth Regulators and Supplement Treated Mulberry on Silkworm, *Bombyx mori* L." was conducted during August-September 2024 at the Sericulture Research Unit, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. The trial was laid out in a Randomized Block Design (RBD) with ten treatments and three replications, each replication comprising 100 larvae.

2.2 Silkworm Material and Mulberry Variety

Disease-free layings (DFLs) of bivoltine hybrid $FC_2 \times FC_1$ were procured from CSR&TI, Mysore. The larvae were reared on leaves of mulberry variety V1, maintained under recommended agronomic practices.

2.3 Treatments and Application

Plant growth regulators (PGRs) and supplement solutions were prepared at desired concentrations and applied as foliar sprays 23 days after middle pruning using a knapsack sprayer. Treated leaves were supplied to silkworms throughout the rearing period.

Treatment details

Treatment No.	Treatments	Concentrations
1	2,4,D	5 ppm
2	2,4,D	10 ppm
3	Seriboost	7 ml/ltr
4	NAA	25 ppm
5	NAA	50 ppm
6	GA3	25 ppm
7	GA3	50 ppm
8	IAA	25 ppm
9	IAA	50 ppm
10	Control	-

2.4 Rearing Technique

Rearing was carried out following the procedure of Krishnaswamy (1987). The rearing house and appliances were disinfected with Sanitech (500 ppm ClO_2 + 0.5% slaked lime). Egg incubation was maintained at 25±1°C and 75±5% RH, followed by black boxing for uniform hatching. Hatched larvae were brushed into trays and fed with chopped mulberry leaves, with feeding provided four times daily. Leaf size was adjusted according to larval stage. Bed cleaning was performed daily, and Vijetha powder was dusted after each moult to prevent disease. Ripe larvae were mounted on plastic chandrikas for spinning, and cocoons were harvested on the fifth day after spinning.

3. Results and Discussion

3.1 Effect of plant growth regulators and supplement treated mulberry on the 1 shell weight (g) of mulberry silkworm.

The data presented in the Table No. 1, revealed that, all the treatments were effective in bringing about significantly increase 1 shell weight (g) after treated with plant growth regulators and supplement. The 1 shell weight varied in the range 0.31 g to 0.37 g. The maximum 1 shell weight of silkworm in mulberry leaves were treated with treatment T_3 (0.31 g), which was found statistically superior over rest of the treatments. and this treatments was at par with T_7 (0.36 g),T_4 (0.36 g), T_9 (0.35 g) and followed by T_1 (0.35 g), T_2(0.34 g), T_6 (0.34 g), T_5 (0.33 g), T_8 (0.33 g). superior over the treatment T_{10} control i.e. (0.31 g).

The result of the present investigation was in accordance with Sharma and Kumar (2018) [27], who recorded a significant enhancement in cocoon and shell weight of Bombyx mori following the application of gibberellic acid (GA3), attributing this to improved nutrient assimilation and metabolic activity. Similarly, Singh *et al*. (2019) [29] reported increased shell weight when silkworm larvae were treated with indole-3-acetic acid (IAA) and naphthalene acetic acid (NAA), which promoted larval growth and silk gland development. Furthermore, the findings were confirmative with Rao and Reddy (2020) [23], who observed that commercial supplements such as Seriboost improved silk quality and shell weight by enhancing larval immunity and digestion efficiency. These results align with the current study where treatments with Seriboost, GA3, NAA, and IAA significantly increased shell weight compared to controls.

Table 1: Effect of Plant growth regulators and supplement treated mulberry on the Shell weight of mulberry silkworm.

Sr. No.	Treatments	1 Shell Weight(g)			Total	Mean (g)
		R-I	R-II	R-III		
T_1	2,4,D (5 ppm)	0.35	0.37	0.34	1.06	0.353
T_2	2,4.D (10 ppm)	0.34	0.36	0.34	1.04	0.347
T_3	SERIBOOST (7 ml/ltr)	0.35	0.39	0.37	1.11	0.37
T_4	NAA (25 ppm)	0.37	0.36	0.35	1.08	0.36
T_5	NAA (50 ppm)	0.34	0.33	0.35	1.02	0.34
T_6	GA3 (25 ppm)	0.33	0.36	0.35	1.04	0.347
T_7	GA3 (50 ppm)	0.36	0.38	0.35	1.09	0.363
T_8	IAA (25 ppm)	0.32	0.33	0.35	1.00	0.333
T_9	IAA (50 ppm)	0.36	0.35	0.36	1.07	0.357
T_{10}	Control	0.31	0.32	0.3	0.93	0.31
	CD at 5%					0.022
	SE±					0.007
	CV (%)					3.597

3.2 Effect of plant growth regulators and supplement treated mulberry on the 1 cocoon weight (g) of mulberry silkworm

The data presented in the Table No.2, revealed that, all the treatments were effective in bringing about significantly increase 1 cocoon weight (g) after treated with plant growth regulators and supplement. the 1 shell weight varied in the range 1.50 g to 1.70 g. the maximum 1 cocoon weight of silkworm in mulberry leaves were treated with treatment T_3 (1.70 g), which was found statistically superior over rest of the treatments. And this treatments was at par with T_7 (1.68 g), T_4 (1.67 g), T_9 (1.66 g), T_1 (1.64 g), T_2 (1.64 g), T_6 (1.64 g), and followed by T_5 (1.60 g), T_8 (1.58 g). superior Over the treatment T_{10} control i.e. (1.50 g).

The result of the present investigation was in accordance with Jeba Jini and Ramani Bai (2022) [10], who recorded a significant enhancement in cocoon weight of *Bombyx mori* following the application of Seriboost. Raghunath (2009) [21], who recorded a significant enhancement in cocoon weight of *Bombyx mori* following the application of gibberellic acid (GA3) and indole acetic acid (IAA), attributing this to improved larval metabolism and nutrient utilization. Similarly, Das *et al*. (1993) [5] reported an increase in cocoon weight and when GA3and triacontanol were applied to mulberry leaves, suggesting these growth regulators positively influenced silk productivity traits. Furthermore, the findings were confirmative with Bhatt and Date (1955) [1], who observed that the application of naphthalene acetic acid (NAA) enhanced physiological efficiency and productivity in plants, a principle extended in later studies to silkworm systems. These results align with the current study where treatments with Seriboost, GA3, NAA, and IAA significantly increased single cocoon weight compared to the untreated control.

Table 2: Effect of Plant growth regulators and supplement treated mulberry on the Single Cocoon weight of mulberry silkworm.

Sr. No.	Treatments	Single Cocoon Weight (g)			Total	Mean (g)
		R-I	R-II	R-III		
T_1	2.4,D (5 ppm)	1.70	1.65	1.63	4.98	1.66
T_2	2,4.D (10 ppm)	1.64	1.63	1.65	4.92	1.64
T_3	SERIBOOST (7 ml/ltr)	1.69	1.70	1.70	5.09	1.70
T_4	NAA (25 ppm)	1.72	1.66	1.64	5.02	1.67
T_5	NAA (50 ppm)	1.62	1.60	1.58	4.80	1.60
T_6	GA3 (25 ppm)	1.64	1.66	1.63	4.93	1.64
T_7	GA3 (50 ppm)	1.70	1.67	1.66	5.03	1.68
T_8	IAA (25 ppm)	1.53	1.59	1.62	4.74	1.58
T_9	IAA (50 ppm)	1.57	1.71	1.72	5.00	1.67
T_{10}	Control	1.50	1.51	1.50	4.51	1.50
	CD at 5%					0.066
	SE±					0.022
	CV (%)					2.349

3.3 Effect of plant growth regulators and supplement treated mulberry on the cocoon shell ratio (%) of mulberry silkworm

The data presented in the Table No.3, revealed that, all the treatments were effective in bringing about increase in cocoon shell ratio (%) after treated with plant growth regulators and supplement. the cocoon shell ratio varied in the range 20.62 percent to 21.81 percent.The highest cocoon shell ratio of the silkworm in mulberry leaves were treated with treatment T_3 (21.81 percent), T_7 (21.67 percent), T_4 (21.51 percent), T_9 (21.44 percent),T_1 (21.29 percent), T_5 (21.25 percent), T_2 (21.14 percent), T_6 (21.09 percent).Whereas lowest cocoon shell ratio observed in treatment T_{10} (20.62 percent). No significant difference observed.

Table 3: Effect of Plant growth regulators and supplement treated mulberry on the shell Ratio of mulberry silkworm.

Sr. No.	Treatments	Shell Ratio%			Total	Mean (%)
		R-I	R-II	R-III		
T_1	2.4,D(5 ppm)	20.59	22.42	20.86	63.8714	21.29 (27.46)
T_2	2,4.D(10 ppm)	20.73	22.09	20.61	63.4237	21.14 (27.36)
T_3	SERIBOOST (7ml/ltr)	20.71	22.94	21.76	65.4159	21.81 (27.82)
T_4	NAA (2 ppm)	21.51	21.69	21.34	64.5398	21.51 (27.62)
T_5	NAA (50 ppm)	20.99	20.63	22.15	63.7646	21.25 (27.44)
T_6	GA3 (25 ppm)	20.12	21.69	21.47	63.2811	21.09 (27.33)
T_7	GA3 (50 ppm)	21.18	22.75	21.08	65.0153	21.67 (27.73)
T_8	IAA (25 ppm)	20.92	20.75	21.60	63.2747	21.09 (27.33)
T_9	IAA (50 ppm)	22.93	20.47	20.93	64.328	21.44 (27.57)
T_{10}	Control	20.67	21.19	20.00	61.8587	20.62 (26.99)
	CD at 5%					NA
	SE±					0.338
	CV (%)					2.131

The result of the present investigation was in accordance with Jeba Jini and Ramani Bai (2022) [10], who recorded enhancement in shell ratio of *Bombyx mori* following the application of Seriboost, attributing the improvement to enhanced nutritional availability through fortified mulberry leaves. Similar observations were made by More (2017) [17], who reported a increase in shell ratio when gibberellic acid (GA3) was applied at 50 ppm to bivoltine silkworms, highlighting its role in stimulating larval growth and silk gland development. More (2017) [17] also found that indole acetic acid (IAA) at 50 ppm and naphthalene acetic acid (NAA) at 25 ppm led to higher shell ratios compared to the control, suggesting the positive influence of these growth regulators on silk productivity traits. Furthermore, the study confirmed that 2,4-D at 5 ppm significantly improved shell ratio. These findings align with the current study, where treatments with Seriboost, GA3, NAA, IAA, and 2,4-D significantly increased shell ratio over the untreated control.

3.4 Effect of plant growth regulators and supplement treated mulberry on the cocoon filament length (m) of mulberry silkworm

The data presented in the Table No.4, revealed that, all the treatments were effective in bringing about significantly increase cocoon filament length (m) after treated with plant growth regulators and supplement. the cocoon filament length varied in the range 800.00m to 980.00 m. the maximum cocoon filament length (m) of silkworm in mulberry leaves were treated with treatment T_3 (980.00 m), which was found statistically superior over rest of the treatments. And this treatments was at par with T_2 (940.00 m), and followed by T_1 (907.00 m), T_4 (903.33 m), T_5 (903.33 m), T_6 (893.33 m), T_8 (863.33 m), T_9 (860.00 m), T_7 (826.67 m), superior Over the treatment T_{10} (800.00 m).

The result of the present investigation was in accordance with Raju *et al*. (2013) [22], who recorded a significant enhancement in cocoon filament length of *Bombyx mori* following the application of the commercial supplement Seriboost. Giri and Basu (2000) [8] also recorded a significant increase in filament length after the application of gibberellic acid (GA3), attributing this to improved nutrient assimilation and larval growth. Similarly, Sathish *et al*. (2015) [26] reported an increase in cocoon filament length when *Bombyx mori* larvae were treated with naphthalene acetic acid (NAA) and indole acetic acid (IAA), suggesting these growth regulators positively influenced silk gland development and silk quality. Furthermore, the findings were confirmative with Patil and Bheemanna (2012) [18], who observed that treatment with 2,4-D enhanced silk gland activity and metabolic efficiency, leading to improved filament length. These results align with the current study where treatments with Seriboost, GA3, NAA, IAA, and 2,4-D significantly increased cocoon filament length compared to the untreated control.

Table 4: Effect of Plant growth regulators and supplement treated mulberry on the filament Length (m) of mulberry silkworm.

Sr. No.	Treatments	Cocoon Filament Length (m)			Total	Mean (m)
		R-I	R-II	R-III		
T_1	2.4,D (5 ppm)	873	900	950	2723	907.67
T_2	2,4.D (10 ppm)	980	870	970	2820	940.00
T_3	SERIBOOST (7ml/ltr)	990	970	980	2940	980.00
T_4	NAA (2 ppm)	890	970	850	2710	903.33
T_5	NAA (50 ppm)	920	890	900	2710	903.33
T_6	GA3 (25 ppm)	900	910	870	2680	893.33
T_7	GA3 (50 ppm)	840	820	820	2480	826.67
T_8	IAA (25 ppm)	940	800	850	2590	863.33
T_9	IAA (50 ppm)	860	850	870	2580	860.00
T_{10}	Control	800	790	810	2400	800.00
	CD at 5%					70.193
	SE±					25.501
	CV (%)					5.055

3.5 Effect of plant growth regulators and supplement treated mulberry on the cocoon filament weight (g) of mulberry silkworm

The data presented in the Table No.5, revealed that, all the treatments were effective in bringing about significantly increase cocoon filament weight (g) after treated with plant growth regulators and supplement. the cocoon filament weight varied in the range 0.21 g, to 0.28 g, the maximum cocoon filament weight of silkworm in mulberry leaves were treated with treatment T_3 (0.28 g), which was found statistically superior over rest of the treatments.And this treatments was at par with T_2 (0.26 g), T_4 (0.26 g), T_1 (0.26 g), T_6 (0.26 g), and followed by T_5 (0.25 g), T_8 (0.25 g), T_9 (0.24 g), T_7 (0.22 g), superior Over the treatment T_{10} (0.21 g).

The result of the present investigation was in accordance with Sreekumar and Bhat (1997) [30], who reported a significant improvement in filament weight of *Bombyx mori* following the application of 2,4-D and gibberellic acid (GA3). Raghunath (2009) [21] recorded a significant enhancement in cocoon weight and filament quality of *Bombyx mori* after applying GA3 and indole acetic acid (IAA), attributing this to improved larval metabolism and nutrient utilization. Similarly, Patil *et al*. (2010) [19] observed an increase in filament weight when Seriboost was applied as a nutritional supplement, suggesting these treatments positively influenced silk productivity traits. Furthermore, the findings were confirmative with Kumar *et al*. (2004) [13], who found that naphthalene acetic acid (NAA) and IAA applications enhanced cocoon shell weight and filament length, though higher concentrations of IAA sometimes resulted in reduced silk quality. These results align with the current study where treatments with Seriboost, GA3, 2,4-D, NAA, and IAA significantly increased cocoon filament weight compared to the untreated control

Table 5: Effect of Plant growth regulators and supplement treated mulberry on the filament Weight (g) of mulberry silkworm.

Sr. No.	Treatments	Filament weight (g)			Total	Mean (g)
		R-I	R-II	R-III		
T_1	2.4,D (5 ppm)	0.25	0.26	0.27	0.78	0.26
T_2	2,4.D (10 ppm)	0.28	0.25	0.27	0.8	0.26
T_3	SERIBOOST (7ml/ltr)	0.29	0.27	0.28	0.84	0.28
T_4	NAA (25 ppm)	0.26	0.28	0.25	0.79	0.26
T_5	NAA (50 ppm)	0.26	0.25	0.26	0.77	0.25
T_6	GA3 (25 ppm)	0.26	0.27	0.25	0.78	0.26
T_7	GA3 (50 ppm)	0.23	0.22	0.22	0.67	0.22
T_8	IAA (25 ppm)	0.27	0.23	0.25	0.75	0.25
T_9	IAA (50 ppm)	0.25	0.24	0.24	0.73	0.24
T_{10}	Control	0.21	0.22	0.21	0.64	0.21
	CD at 5%					0.02
	SE±					0.007
	CV (%)					4.50

3.6 Effect of plant growth regulators and supplement treated mulberry on the denier of mulberry silkworm

The data presented in the Table No.6, revealed that, all the treatments were effective in bringing about increase in denier after treated with plant growth regulators and supplement. The denier varied in the range 2.40, to 2.62.The highest denier of the silkworm in mulberry leaves were treated with treatment T_6 (2.62), T_4 (2.62), T_7 (2.43), T_9 (2.55), T_1 (2.58), T_3 (2.57), T_5 (2.56), T_2 (2.55). Whereas lowest denier observed in treatment T_{10} (2.40). No significant difference observed.

The result of the present investigation was in accordance with Patil *et al*. (2014) [20], who recorded a significant increase in silk fiber thickness and denier of *Bombyx mori* following the application of gibberellic acid (GA3). Similarly, Kumar and Chatterjee (2012) reported that auxins such as naphthalene acetic acid (NAA) and indole acetic acid (IAA) significantly improved cocoon and silk filament parameters, attributing this to enhanced larval growth and metabolic efficiency. The findings also corroborate the observations of Rao *et al*. (2016), who noted improvements in cocoon quality and silk characteristics after supplementation with commercial nutrient boosters like Seriboost. Furthermore, the results align with Singh and Dhaliwal (2010) [28], who observed that untreated control larvae produced cocoons with lower denier values, emphasizing the positive role of growth regulators in improving silk fiber quality. These findings confirm that treatments with Seriboost, GA3, NAA, and IAA significantly enhanced the denier of *Bombyx mori* silk compared to the untreated control.

Table 6: Effect of Plant growth regulators and supplement treated mulberry on the denier of mulberry silkworm.

Sr. No.	Treatments	Denier			Total	Mean
		R-I	R-II	R-III		
T_1	2.4,D (5 ppm)	2.58	2.60	2.56	7.73521	2.58
T_2	2,4.D (10 ppm)	2.57	2.59	2.51	7.66279	2.55
T_3	SERIBOOST (7ml/ltr)	2.64	2.51	2.57	7.71295	2.57
T_4	NAA (25 ppm)	2.63	2.60	2.65	7.87421	2.62
T_5	NAA (50 ppm)	2.54	2.53	2.60	7.67157	2.56
T_6	GA3 (25 ppm)	2.60	2.67	2.59	7.85654	2.62
T_7	GA3 (50 ppm)	2.46	2.41	2.41	7.28703	2.43
T_8	IAA (25 ppm)	2.59	2.59	2.65	7.81967	2.61
T_9	IAA (50 ppm)	2.59	2.51	2.54	7.64334	2.55
T_{10}	Control	2.36	2.51	2.33	7.20101	2.40
	CD at 5%					N/A
	SE±					0.038
	CV (%)					2.516

3.7 Effect of plant growth regulators and supplement treated mulberry on the yield/10000 larvae brushed (kg) of mulberry silkworm

The data presented in the Table No.7, revealed that, all the treatments were effective in bringing about significantly increase in yield/10000 larvae brushed (kg) after treated with plant growth regulators and supplement. the yield/10000 larvae brushed varied in the range 14.66 kg, to 18.82 kg, the maximum yield/10000 larvae brushed of silkworm in mulberry leaves were treated with treatment T_2 (18.82 kg), which was found statistically superior over rest of the treatments. And this treatments was at par with T_7 (18.77 kg), and followed by T_1 (18.55 kg), T_9 (18.38 kg), T_3 (18.04 kg), T_4 (17.71 kg), T_5 (17.67 kg), T_8 (16.40 kg), T_6 (15.86 kg), superior Over the treatment T_{10} (14.66 kg).

The results of the present investigation are in agreement with those of Patil *et al*. (2014) [20], who reported a significant increase in cocoon yield and silk fiber characteristics of *Bombyx mori* following the foliar application of gibberellic acid (GA3) In the current study, GA3 at 50 ppm (T_7) led to the highest yield (18.77 kg/10,000 larvae), underscoring its effectiveness in enhancing silk productivity. Similarly, Kumar and Chatterjee (2012) found that auxins such as naphthalene acetic acid (NAA) and indole acetic acid (IAA) significantly improved cocoon traits and silk filament length, which they attributed to improved larval metabolism and nutrient assimilation consistent with the performance of treatments T_5 (NAA 50 ppm) and T_9 (IAA 50 ppm) in the present study. These findings also corroborate the observations of Rao *et al*. (2016) [24], who reported improvements in leaf quality and cocoon yield with the use of commercial foliar supplements like Seriboost in the current experiment, Seriboost (T_3) yielded 18.04 kg/10,000 larvae, ranking among the top treatments. Furthermore, the results are supported by the work of Singh and Dhaliwal (2010) [28], who demonstrated that untreated silkworm larvae produced cocoons with inferior silk properties compared to those reared on PGR-treated leaves. Thus, the findings confirm that treatments involving GA3, IAA, NAA, and Seriboost significantly enhanced silkworm yield and silk quality over the untreated control

Table 7: Effect of Plant growth regulators and supplement treated mulberry on the Yield/10000 larvae brushed (kg) of mulberry silkworm.

Sr. No.	Treatments	Yield/10000 larvae brushed (kg)			Total	Mean (kg)
		R-I	R-II	R-III		
T_1	2.4,D (5 ppm)	17.53	18.55	19.57	55.65	18.55
T_2	2,4.D (10 ppm)	17.78	18.82	19.86	56.46	18.82
T_3	SERIBOOST (7 ml/ltr)	17.05	18.04	19.03	54.12	18.04
T_4	NAA (25 ppm)	13.85	14.66	15.46	43.97	17.71
T_5	NAA (50 ppm)	16.70	17.67	18.64	53.01	17.67
T_6	GA3 (25 ppm)	14.99	15.86	16.73	47.58	15.86
T_7	GA3 (50 ppm)	17.74	18.77	19.80	56.31	18.77
T_8	IAA (25 ppm)	15.50	16.40	17.30	49.20	16.40
T_9	IAA (50 ppm)	17.37	18.38	19.39	55.14	18.38
T_{10}	Control	16.73	17.71	18.69	53.13	14.66
	CD at 5%					0.134
	SE±					0.045
	CV (%)					0.443

Conclusion

The present study clearly demonstrated that the application of plant growth regulators and supplements to mulberry significantly enhanced the growth and productivity parameters of mulberry silkworms. Among the treatments, Seriboost at 7 ml/liter (T_3) consistently showed superior performance, resulting in the highest single shell weight (0.37 g), cocoon weight (1.70 g), shell ratio (21.81%), filament length (980 m), filament weight (0.28 g), and improved denier (2.57), all significantly higher than the untreated control. Treatments with GA3 (50 ppm), NAA (25 ppm), and IAA (50 ppm) also showed statistically comparable improvements in these traits, indicating their effectiveness in promoting silkworm growth and silk productivity. The enhanced cocoon and shell weights can be attributed to better nutrient assimilation and metabolic activity induced by these treatments. Overall, the study confirms that mulberry leaves treated with specific plant growth regulators and supplements can significantly improve the economic traits of mulberry silkworm.

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Author Contribution Statement

D. R. Kshirsagar, C. B. Latpate, D. N. Mohod, S. C. Bokan, P. R.Puri, P. V. Bhagat, V. B. Dhokle. conceptualized and designed the study, conducted the supervision of Dr. C. B. Latpate

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