



RESEARCH ARTICLE

GROWTH PROMOTING EFFECT OF BLACK GRAM AND GROUND NUT SEED POWDER ON
Bombyx mori

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ABSTRACT

Problem Statement: The silkworm requires certain essential sugar, proteins, amino acids, fatty acid, vitamins and micronutrients for its growth and higher production of good quality of silk. The low productivity is mainly due to low mulberry yield and poor quality of leaf mentioned that enrichment of mulberry leaves with supplementary compounds enhances the silk productivity. To evaluate the effect of mulberry leaves supplemented with ground nut powder and black gram powder mixture feeding the silkworm.

Approach: The groundnut seed powder and Black gram power in different doses. This groundnut powder and black gram power separately sprayed on the leaves of the mulberry plant before feeding. Feeding started with 3rd instars larvae. Every day supplementation was given two times and for the other 3 times of feeding, mulberry leaves were alone given.

Result: The ground nut treatment of (2%) food consumption (531mg/wt/animal/day) food absorption in higher (243mg/wt/animal/day) was observed 2% concentration. Approximate digestibility in higher (45.76) was observed 2% concentration. Efficiency of conversion of ingested food in higher (26.18mg/wt/animal/day) was observed. The results of the present study recommend supplementation of black gram and ground nut with mulberry leaf for feeding *Bombyx mori*. L.

Conclusion: The results of the present investigation indicated that the Ground nut powder, blackgram powder and their mixtures have effect on the economic parameters of the silkworm, *B. mori*.

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INTRODUCTION

India has long tradition of producing and using silk, the queen of fabrics; it produces all the four main types of silk, Mulberry, Tassar, Eri and Muga. Among them, Mulberry silk accounts about 90 (%) of total production. India occupies a unique position among the silk producing countries and ranks second with production of 13,000 tones per annum and shares about 14 (%) of the global silk production. Quality of mulberry leaves is one of the major factors influencing the health and growth of silkworm subsequently successful cocoon harvest. The nutritional levels of different cultivars of mulberry influence the larval growth of silk worm which ultimately reflect in the economic traits such as yield, cocoon and shell weight and shell (%). (Quiyyum *et al.*, 1991; Sudo *et al.*, 1979). In addition to mulberry leaves, feed supplements are also given

to silkworm to enhance economic characteristics (Jeyapal *et al.*, 2003) he supplementary diets commonly used for enhancing the nutrition of silkworm according to the feeding habits. To enhance the economic traits of *Bombyx mori*, the regular mulberry leaf feed is supplemented with several other nutritive compounds. These supplement feeds had been reported to enhance metabolic activity and a high protein production (Sheba *et al.*, 2006). A Iso the supplement feeds enhance the quality of the silk and reduces the developmental periods in between different instars (Padmalatha, 2004). The supplement feeds are provided along with the regular mulberry leaves. In the present study protein rich black gram and groundnut powder were supplemented with regular mulberry leaves. To find out whether there feed supplements enhance the growth metabolism and economic characteristics of the silk produced by *B.mori*. They found very difficult to use conversion of pyruviacid, white they were typing to trace the food intake promoting factors in the residue of Mulberry leaf

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powder. They found the food intake promoting action in vanilline. M According to (Hiratsuka, 1920) When β Carotene vitamin E were added to the dining diet the 5th star, the egg production was almost the same as that of the rearing on mulberry leaves. The artificial diet on the rearing performance of silkworm in an around Tirunelveli District of Tamil Nadu and hence this attempt has been made to evaluate the artificial diet on the rearing performance of silkworm. The antibiotic feed supplementation not only showed prophylactic measures to prevent bacterial infections but also enhanced the nutrition and economic parameters in *B.mori* (Sheebha *et al.*, 2008) (A selected group of antibiotics, reserved for animal use only, were used to help growing animals digest their food more efficiently, get maximum benefit from it and allow them to develop into strong and healthy individuals. This was achieved by destroying or inhibiting undesirable bacteria in the gut which prevent optimum absorption of food (Phillips *et al.*, 2004). Different antibiotics as growth stimulating factors are extensively used to enrich the nutrition of farm and other animals for their increased productivity (Baig, *et al.*, 1990). ortification of mulberry leaves is considered as one of the effective methods to enrich the silkworm diet. The biochemical parameters could be elevated by antibiotic supplementation in healthy larvae (Verma and Atwal, 1963). Larvae reared on Mulberry leaves used to serve as control. Evaluation also carried out for larval weight, larval duration, cocoon weight, cocoon shell weight effective rate of rising.

MATERIALS AND METHODS

Hybrid, between a Multivoltine and Biovoltine strain of *Bombyx mori* (NB4D2) were purchased from the Government Grainage, Tenkasi, India and maintained at a temperature of $27\pm 2^\circ\text{C}$ and relative humidity, 75-80%. The eggs were allowed to hatch. At the III and IV instar larval stages supplementary feed, Groundnut seed powder and Black gram collected from Tirunelveli store, Tirunelveli. Weighed quantities of fresh mulberry leaves were separately sprayed with aqueous solution of the respective feed supplement. The groundnut seed powder and Black gram power in different doses (1, 2 and 3%). This groundnut powder and black gram power separately sprayed on the leaves of the mulberry plant before feeding. Feeding started with 3rd instars larvae. Every day supplementation was given two times and for the other 3 times of feeding, mulberry leaves were alone given. Treated leaves were given as the first feed for the day, beginning from the first day of fifth instar till sixth day. Control worms were given normal leaves. All the temperature in the rearing chamber was maintained at $28\pm 2^\circ\text{C}$ and the RH was $73\pm 5\%$. All the rearing operations were carried out according to (Krishnaswami, *et al.*, 1973). The observation on economic parameters such as mature larval weight, cocoon weight, pupal weight, shell weight, shell ratio, filament length, consumption and growth parameters were measured on dry weight basis (Waldbaver, 1968).

Table 1. Influence of Foliar supplementation diet on the Economic parameters of silk worm

Experiment	Concentration (%)	Cocoon weight (mg)	Pupal weight (mg)	Shell weight (mg)	Shell ratio (%)	Filament length (m)
Control		1486±142	1261±123	225±26	15.14	440±6
Black gram	1	1597±151 (7%)	1327±130 (5%)	270±31 (2%)	16.91	493±5 (12%)
	2	1760±148 (18%)	1458±121 (15%)	302±34 (34%)	17.16	510±8 (15%)
	3	1684±133 (13%)	1399±118 (15%)	285±28 (26%)	16.92	502±6 (14%)
Ground nut	1	1523±131	1271±119 (1%)	252±25 (12%)	16.55	468±5 (6%)
	2	1656±142 (11%)	1373±124 (8%)	283±28 (25%)	17.09	497±7 (12%)
	3	1547±136 (4%)	1238±118 (2%)	259±271 5(%)	16.74	474±9 (7%)

Table 2: Influence of black gram on energy budget of *Bombyx mori*

Parameters	Control	Black gram		
		1 (%)	2 (%)	3 (%)
Food consumption (g.dry wt. animal/day)	406±58	512±56 (26%)	547±49 (34%)	533±42 (31%)
Food absorption (g.dry wt. animal/day)	171±33	239±31 (39%)	261±33 (52%)	253±28 (47%)
Weight Gain (g.dry wt. animal/day)	96±8	136±8 (41%)	150±7 (56%)	144±6 (50%)
Relative Consumption Rate (RCR) (g.dry wt. animal/day)	126±13	158±14 (25%)	176±12 (39%)	163±11 (29%)
Relative Growth Rate (RGR) (g.dry wt. animal/day)	21±2	29±3 (38%)	35±2 (66%)	30±2 (42%)
Approximate Digestibility (AD) (%)	42.12	46.68	47.70	47.47
Efficiency of Conversion of Ingested food (ECI)	23.65	25.56	27.42	27.02
Efficiency of Conversion of Digested food (ECD)	56.14	56.90	57.40	756.92

Percentage changes are given in parenthesis

Table 3: Influence of Ground nut on energy budget of *Bombyx mori*

Parameters	Control	Ground nut		
		1 (%)	2 (%)	3 (%)
Food consumption (g.dry wt. animal/day)	406±58	474±53(26%)	531±57(34%)	
	524±43(31%)			
Food absorption (g.dry wt. animal/day)	171±33	208±31(21%)	243±29(42%)	223±28(30%)
Weight gain (g.dry wt. animal/day)	96±8	118±8(422%)	130±7(44%)	
	127±8(532%)			
Relative consumption rate (RCR) (g.dry wt. animal/day)	126±13	134±16(63%)	161±13(27%)	
	153±14(21%)			
Relative Growth Rate (RGR) g.dry wt. animal/day)	21±2	27±2(28%)	30±3(42%)	28±3(33%)
(Approximate Digestibility (AD) (%)	42.12	43.88	45.76	42.56
Efficiency of Conversion of Ingested food (ECI)	23.65	24.89	26.18	24.024
Efficiency of Conversion of Digested food (ECD)	56.14	56.73	57.20	76.95

Percentage changes are given in parenthesis

The review deals with the current situation and probable strategies for enhancing the productivity and quality of tasar raw silk. (Reddy. *et al*, 2011)

RESULTS

The growth and development of silkworm is under the continuous influence of factors operating within and outside the body (Murugan and Senthilkumar, 1998). It is evident from the mean data of the experiments that in general, black gram and ground nut powder treated mulberry leaves show a marginal tendency to improve many of the economic aspects compared to the control group of worms that were fed only mulberry leaves. The results of the influence of black gram and groundnut powder on the on economic parameters of silkworm are given in present in (Table 1). Treatment of worms with 2% concentration of blackgram recorded maximum cocoon weight (1760±), Pupal weight (1458±), shell weight (302±), shell ratio (17 and 16%) and filament length (510 m) upon treatment are present in (Table 2). Significant increase in food consumption rate was noticed. During supplement of blackgram and ground nut powder treatment over the control. The ground nut at 2% concentration recorded maximum cocoon weight (1656±) pupal weight (1399±) shell weight (283±) shell ratio (17.09%) filament length (497 m) The highest food absorption (261mg/per/animal/day) was observed in 2% concentration of black gram treated group. When compared with control and ground nut treatment. Relative consumption rate varied consider on different artificial diet treatment (2%). However, the ground nut treatment of (2%) food consumption (531mg/wt/animal/day) food absorption in higher (243mg/wt/animal/day) was observed 2% concentration. Approximate digestibility in higher (45.76) was observed 2% concentration. Efficiency of conversion of ingested food in higher (26.18mg/wt/animal/day) was observed (Table 3). The results of the present study recommend supplementation of black gram and ground nut with mulberry leaf for feeding *Bombyx mori* L.

DISCUSSION

Various growth parameters like Relative Consumption Rate (RCR) Relative Growth Rate (RGR), weight gain, Approximate Digestibility (AD), Efficiency of Conversion of Digested Food (ECD) and Efficiency of Conversion of Ingested Food (ECI) were enhanced by the Amway supplementation. (AmalaRani, G.A et al, 2011). Supplementation with Potassium Carbonate, Magnesium Carbonate and their synergetic effects on the economic traits of the silkworm, *Bombyx mori* l. (S. Chakrabarty and B.B.Kaliwal, 2011). *Bombyx mori* fed with mulberry leaves coated with the powders of blank gram and ground nut showed a significant difference in various economic traits when compared to the worms that were fed mulberry leaves alone. Foliar supplementation of black gram powder and ground nut powder at concentration of 2% showed an enhanced. Cocoon weight, shell weight, shell ratio and filament length.

When *B.mori* was given 1 and 3% concentration blackgram and groundnut powder the hike in economic characteristics were not high (Table 1). When compared to the worms. The farmers are used advised to use foliar supplementation treatment along with mulberry leaves for the silk worm rearing to get more profit.

CONCLUSION

The results of the present investigation indicated that the Ground nut powder, blackgram powder and their mixtures have effect on the economic parameters of the silkworm, *B. mori*.

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