

LARGE-SCALE EXPERIMENTS ON THE EFFECT OF CHLOROMYCETIN AND GLYCINE IN THE NUTRITION OF SILKWORM *Bombyx mori*, L.

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SUMMARY

Large-scale experiments conducted on the use of chloromycetin and glycine, singly and in combination, in the nutrition of the silkworm have indicated the possibility of these being advantageous to the sericultural industry.

INTRODUCTION

Previous reports from this laboratory (Murthy and Sreenivasaya, 1953; Murthy *et al.*, 1954; Sharada and Bhat, 1956) indicated the possibility of using chloromycetin and glycine as supplements to the mulberry leaf diet of the silkworm for the increased output of silk. Whereas chloromycetin has been shown to enhance the growth of silkworms, glycine has been observed to increase the growth of worms as well as silk production. A simultaneous supplementation of chloromycetin and glycine has further been reported to result in the better growth of the larvæ and in the increased yield of silk in a recent study (Sharada and Bhat, 1956), and the dosage for the two supplements has also been worked out by these authors in the same paper. In this communication are presented the results of a field-scale experiment carried out at the Central Sericultural Research Institute at Channapatna on the effect of the two supplements in the nutrition of the silkworm.

MATERIALS AND METHODS

Disease-free Mysore \times C. Nichi 1, silkworm eggs were used for the experiment. Soon after the IV moult, five batches of 1,500 worms each were made for experimental study comprising:—

1. Rearing on mulberry leaves only,
2. " " " sprayed with water
3. " " " " chloromycetin
4. " " " " glycine
5. " " " " chloromycetin + glycine

Dosage

(a) *Chloromycetin*.—50 mg./kg. body weight administered on alternate days in the morning and evening.

(b) *Glycine*.—2 mg./larva/day daily administered in the morning and evening.

(c) *Chloromycetin + glycine*.—Chloromycetin 25 mg./kg. body weight and glycine 1 mg./larva/day administered daily in the morning and evening.

Fresh solutions were prepared daily in such a way that 25 ml. of the solution was used for spraying 200 g. of mulberry leaf. Half the solution was used in the morning and the rest was used for the evening feeding.

With a view to understand the economy or otherwise of leaves resulting from these supplementations, weighed amounts of leaves were fed daily. The leaves left over as also the excretory matter were separated at 24-hour intervals and weighed without prior drying.

The larval growth was studied by taking daily weights of 6 batches of 100 worms each from the 5 different batches. Mortality of worms was recorded daily.

At the time of spinning, the mature worms were collected and allowed to spin cocoons on bamboo mountages. After 5 days, the cocoons were harvested and sorted out. The number of superior cocoons were counted. The average weight of 100 cocoons and of 100 silk shells was determined by taking 6 replicates from each batch.

RESULTS AND DISCUSSION

TABLE I

Larval growth

(weight of 100 worms in g.)

Supplement	Number of days after IVth moult				
	1	2	3	4	5
None	.. 48.00	77.6	114.5	141.2	166.1
Water	.. 42.3	74.0	114.8	137.8	163.0
Chloromycetin	.. 47.3	78.3	115.5	142.8	167.5
Glycine	.. 42.4	75.5	113.4	133.2	167.0
Chloromycetin + glycine	44.2	74.9	109.5	135.9	163.0

Table I shows that the larval growth is not enhanced to any appreciable extent with any of the supplements tried. In fact, the growth of worms fed on mulberry leaves alone registered a better growth. The percentage survivals given in Table III also indicate that little advantage is conferred by the supplements

individually, though the chloromycetin and glycine mixture and water as such indicated a lower mortality level over others.

TABLE II
Consumption and wastage of leaf
(expressed in g. for the whole instar)

Supplement	Leaf supplied	Left-over leaf	Excreta	Percentage wastage
None	.. 13285	5538	3007	41.7
Water	.. 13285	4830	3300	36.4
Chloromycetin	.. 13285	5662	3019	42.6
Glycine	.. 13285	6559	2928	49.4
Chloromycetin + glycine	.. 13285	5582	3043	42.0

TABLE III
Cocoon yield and silk yield

Supplement	Superior cocoons (Nos.)	Percentage survival	Wt. of 100 cocoons (in g.)	Wt. of 100 silk shells (in g.)	Percentage of silk
None	.. 1027	68.5	95.1	10.9	11.47
Water	.. 1060	70.5	91.7	10.5	11.45
Chloromycetin	.. 992	66.0	97.4	11.7	12.01
Glycine	.. 914	61.0	93.0	11.2	12.04
Chloromycetin + glycine	1060	70.5	95.5	11.5	12.04

The last column in Table II gives the wastage of leaf per 100 g. of leaf supplied for the whole instar (without taking into consideration the loss of moisture which is assumed to be uniform in all the batches). It is interesting to observe that the wastage is high in the glycine-treated worms and low in water-treated worms. Leaf consumption is not affected by chloromycetin administration. Since the

same quantity of leaf has been fed to all the five batches, it would appear that a slightly smaller quantity of leaves would suffice for the needs of the worms when treated with glycine. On the other hand, the higher mortality rate in this batch would point to the possibility of the treatment affecting adversely their life in general, including feeding capacity. Worms reared on leaves sprayed with water alone seem to consume more leaves, even as they excrete more, an observation in accordance with the results registered before (Shyamala *et al.*, 1956).

Table III gives the silk yield and percentage of silk. All the supplements under trial yield slightly larger quantities of silk than the control of fresh leaves. Chloromycetin individually and in combination with glycine yields about 6% more silk than the control worms reared on only mulberry leaves.

Taking into consideration the yield of superior cocoons, leaf consumption and yield of silk, chloromycetin and also chloromycetin + glycine combination seem to be promising supplements that could be used with advantage in industrial sericulture.

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