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Supplementary effect of yeast (*Saccharomyces Cerevisiae*) on rearing performance of Eri Silkworm (*Philosamia Ricini*) in respect of some larval parameter

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Abstract

Silkworm need higher protein & probiotic in their diet to help its body repair cell & to make fiber exclusively at V instar. Nutrition of silkworm is sole factor which at most individually quality and quantity of silk (Laskar and Datta, 2000). Hence in the present investigation an attempt is made to study the impact fortification of castor leaf with certain food probiotic microorganism Yeast *Saccharomyces cerevisiae* on some larval weight & larval length of Eri silkworm *Philosamia ricini*. Data is collected and subjected to the statical analysis. The results indicate that there is a better larval weight and larval length when yeast (probiotic) were used. Silkworm were fed 3 different doses of yeast (*Saccharomyces cerevisiae*) along with castor leaf (100ppm, 200ppm, 300ppm foliar spray) and one control at Once a day , Twice a day and Trice a day.

Keywords: - Yeast, Silkworm, Probiotic, Larval Parameter, Sericulture, Saccharomyces cerevisiae

Introduction

Sericulture involves rearing of silk worm and production of silk. Silk is highly valued natural textile fiber of animal origin. No other fabric has fascinated man over millennia as silk. Silk is popular because of its qualities like texture, luster, tensile qualities, comfort, and adaptability to all climatic condition, royal look, natural shine, soft, inherent affinities for dies and vibrant colors, high absorbance, light weight (Anonymous 1981a, 1981b, 1987, 1994). Nutritional study on silkworm is an essential prerequisite for its proper commercial exploitation. Nutrition of silkworm is sole factor which almost individually augment quality and quantity of silk (Laskar and Datta 2000). Eri silkworm, *Philosamia ricini* is a multivoltine sericigenous insect and largely reared by the farmers of north estern part of India, particularly in Assam (Sahu *et al*., 2006).

Eri silk is known as Non Violence or Ahinsa Silk (there is no need to kill the pupae inside the cocoon as in the case of other silk because the Eri silk is spun into thread like cotton). Monks in India prefer this silk due to non-violence silk. It is also said to be Poor person's silk because its cost of production is very less than other silk.The Ericulture being carried out throughout the year in areas because of the abundant availability of castor plants in the rural areas (Rao *et al.,* 2005; Siddique 2009). The quality of feed plays a remarkable role for growth and development of silkworm and ultimately on the economic traits of cocoons (Hazarika *et al.,* 2005). The effect of host plant species on the growth and development in the insects has been reported.The growth and development of larval and cocoon production are greatly influenced by nutritional quality of castor leaves. In recent year attempts have made in sericulture with nutrients such as proteins, carbohydrates, amino acids, vitamins, sterols, hormones, antibiotics etc. for better performance and get higher yield, quality and quantity of cocoon.(Sannappa,2002). Yeast (Probiotics) are the live microbial food supplements beneficially affecting host by improving the microbial balance and enhanced rapid cellular growth and development (Fuller *et al.,* 1993). Impact of probiotics (*Saccharomyces cerevisiae*) treatment on mulberry leaves to modulate the economic parameters of V instar larvae of *B. mori* were studied (Jeyapal *et al.,* 2004). Normally probiotic microorganisms are non-pathogenic and non toxigenic, retain viability during storage and survive passage through the stomach and small bowel (Macfarlane, 1992).

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Material and Methods

The Present study conducted in Zoology Department Govt. P.G. Madhav Vigyan Mahavidhyalaya, Ujjain. Department has a well-established and equipped sericulture laboratory and well maintained Castor garden for nourishment of Eri silkworm. In the present study the insect were reared in the Sericulture laboratory on Castor plant leaves. The Eggs of Eri silkworm ware collected form Sericulture Rearing Centre, Indore (M.P.) and reared for the purpose of these studies. The eggs were disinfected by the method described by Steinhaus (1949). Eri Silkworm rearing has been conducted for our research work by the standard rearing method which was adopted.Our experiments design to study the qualitative effect of Yeast (*Saccharomyce*s *cerevisiae*) on Larval Parameter (Larval Weight, Larval Lenght) of Eri silkworm (*Philosamia ricini*). Yeast (*Saccharomyces cerevisiae*) can grow in Microbiology Lab from microbial yeast culture (By dilution plate count method). Yeast is dissolving in distilled water and diluted up to each into 100 ppm, 200ppm and 300ppm concentrations. Fifth instar larvae are dividing into 20 experimental batches including control, each group consisting 10 larvae. Five replications were maintained for each of the treatments. Fresh Castor leaves are soaked with aqueous extract of yeast and, then leaves were dried under fan before feeding to the silkworm till end of the fifth instar. My Study is designed for observes improvement in Larval parameter Larval weight and Larval lenght of Eri silkworm (***Philosamia ricini***) in reference to profitability.

Treatment details;-

Batches B1-B9 treated with Yeast (*Saccharomyces cerevisiae***)**

B1, B2, B3 - 100ppm – once/day, Twice/day, Thrice/day - Respectively

B4, B5, B6 - 200ppm - once/day, Twice/day, Thrice/day- Respectively

B7, B8, B9 - 300ppm - once/day, Twice/day, Thrice/day- Respectively

B10 – Control. (Simple leaves without Spirulina).

Statistical analysis

The data were subjected to statistical analysis of variance for identifying significant differences among the treatments using standard method under MS Excel software. Significant tests were carried out using Dunnett's comparison method.

Result and Discussion

The result of the present study correlates the growth promoting effect of water soluble proteins and vitamins viz., B2, B6 and C are found in yeast and it is treated on silkworm biosduval with vitamins and amino acids enhance the larval weight and larval length. The Analysis of Variance has indicated high significant differences (at p = 0.01) between the treatment values in respect of Larval weight, Larval lenght are shown in Table-1& also in table 2. The treatment with 300ppm concentration yeast (*Saccharomyces cerevisiae*) has very significantly increased the larval weight and larval length when compared with control.

Table 1: The Effect of various doses of Yeast (*Saccharomyces cerevisiae*) by different method of treatments on rearing performs of Eri silkworm (*Philosamia ricini*) on larval weight

Percentage Conc. / Dosage	once/day Larval weight (in gm)	Twice/day Larval weight (in gm)	Thrice/day Larval weight (in gm)
100ppm	7.200	7.230	7.270
200ppm	7.230	7.270	7.350
300ppm	7.270	7.410	7.550
CONTROL	7.200		

Table No.2: The Effect of various doses of Yeast (*Saccharomyces cerevisiae*) by different method of treatments on rearing performs of Eri silkworm (*Philosamia ricini*) on larval length.

Percentage Conc. / Dosage	once/day Larval length (in cm)	Twice/day Larval length (in cm)	Thrice/day Larval length (in cm)
100ppm	6.210	6.270	6.350
200ppm	6.270	6.350	6.450
300ppm	6.380	6.450	6.650
CONTROL	6.200		

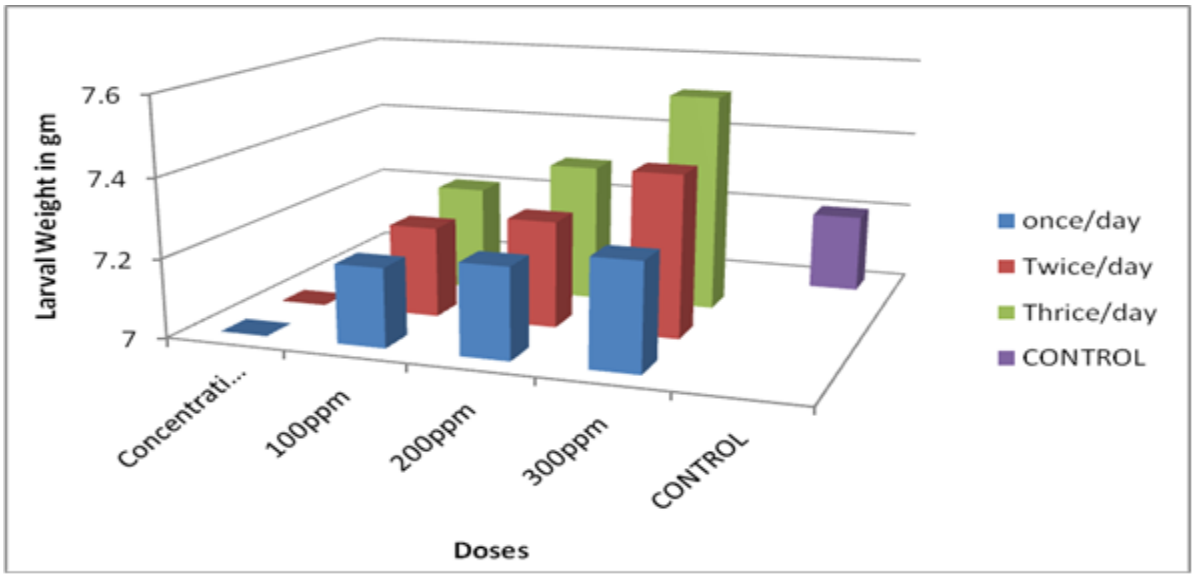

Fig. 1. The Effect of various doses of Yeast (*Saccharomyces cerevisiae*) by different method of treatments on rearing performs of Eri silkworm (*Philosamia ricini*) on larval weight.

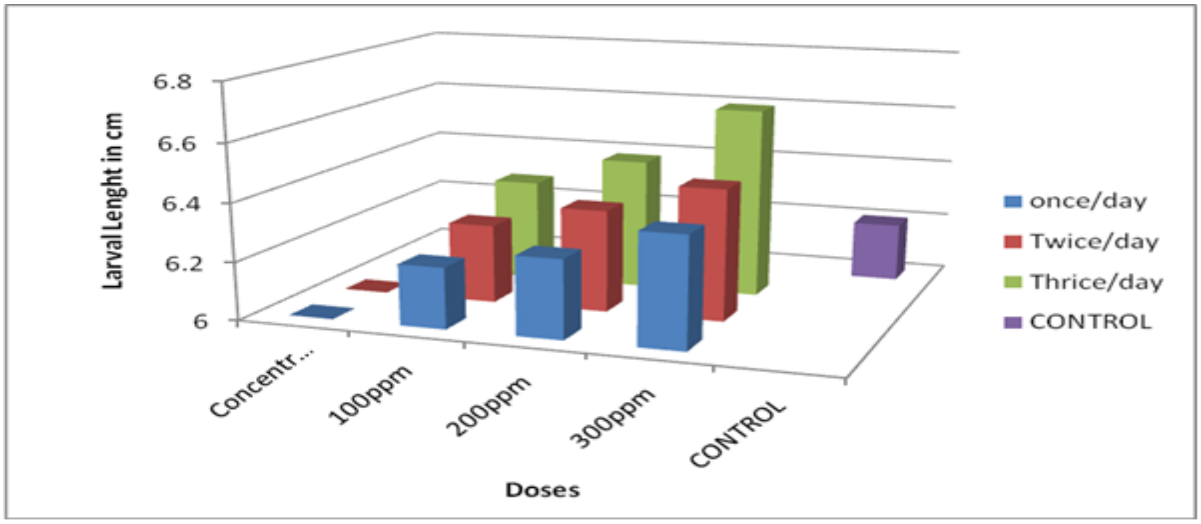

Fig.2: The Effect of various doses of Yeast (*Saccharomyces cerevisiae*) by different method of treatments on rearing performs of Eri silkworm (*Philosamia ricini*) on larval length.

Therefore, the 300ppm concentration has shown high impacts on the both larval characters. Secondly, the differences between 300 ppm concentration and other two concentrations namely 100 and 200 ppm are also significant. The differences between 100 and 200 ppm concentrations are also found to be significant in respect of larval weight and larval length. Analysis of the results as discussed indicates that the 300 ppm thrice / day concentration treatment is found to be significant in increasing the larval growth.

Average Larval weight was highest under 300ppm thrice / day concentration followed by 200ppm) 100 ppm and control .As shown in Table no.01.

Average Larval length of larvae recorded was highest with 300 ppm (0.65gm) thrice/day concentration following by 200ppm, 100ppm and control. As shown in table No.02.

Conclusion

Differences between the treatments of yeast (*Saccharomyces cerevisiae*) were found significant in Larval characters (Larval Weight, Larval length) are significantly higher at 300ppm (B9) Trice/day concentration compared to control, 100ppm and 200ppm once/day, twice/day, thrice/day.

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