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Effect of Some Diets on Longevity and Fecundity of Lesser Wax Moth

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Abstract

Lesser wax moth *Achroia grisella* was cultured in the laboratory. Effect of different diets on longevity of adults and fecundity of females of lesser wax moth was studied. Honey solution, glucose solution, yeast + honey + glucose mixture and distilled water were used as foods for lesser wax moths. Each treatment was replicated 10 times. It was observed that mean life of male irrespective of any diet was longer than that of a female. Comparison of longevity of male moths on different diets showed that they lived longest when fed on glucose solution or honey solution but statistical analysis showed that there was no significant difference in duration of lives on male moths in different treatments. The life of female moth was longest on mixture of yeast, glucose and honey. T-test indicated that at 5% level this mixture was significantly different than all other treatments and could be taken as a best treatment for longest life of female *A. grisella* moth. Females laid maximum number of eggs when fed on mixture of yeast, glucose and honey. To check the significance among different treatments T-test was applied which indicated that in both 5% and 1% levels this mixture was the best treatment. Female moths lived longest and laid maximum number of eggs when provided mixture of yeast, glucose and honey on account of being nearest to the natural food. Thus the mixture of yeast, glucose and honey was the best diet for higher production of *A. grisella* in the laboratory.

Key words: Lesser wax moth, Diets, Longevity, Fecundity

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Introduction

Insect larvae are the most favourite diet of chicks of Galliformes. To provide larvae to young chicks for better growth, Lesser wax moth *Achroia grisella* (F.) (Farm. Galleridae) was cultured in the laboratory. To probe the means to increase culture of this insect in the laboratory, effect of different diets on longevity of adult and fecundity of females of *A. grisella* was studied. Previously although Oldiges (1959), Hussanein *et al.* (1970a) and El-Borollosy *et al.* (1973) made studies of biology and ecology of *A. grisella*, this aspect of its biology remained neglected. Hussanein *et al.* (1970b) were the only workers who investigated effect of different natural foods of *A. grisella* larvae on development, longevity and oviposition. The work presented in this paper is an account of some diets of *A. grisella* moth on their longevity and fecundity.

Materials and Methods

Honey solution (20%), glucose solution (20%), yeast-honey-glucose mixture and distilled water were used as foods for *A. grisella* moths. To make the mixture, 1.5g dry yeast was first mixed in boiling 160ml distilled water and then 20g each honey and glucose were added and thoroughly mixed. A 1cm cotton ball soaked with a liquid was given to a pair of lesser wax moth for feeding in a 200cm glass jar. From newly emerged *A. grisella* moths, 50 mating pairs were located randomly. Four pairs were given separately glucose solution, honey solution, yeast + honey + glucose mixture and simple distilled water while 5th pair was not given any food and kept as control. Each treatment was replicated 10 times. For oviposition a cotton cloth piece was provided in the jar and all jars containing ovipositing females were kept under a dark cloth sheet to avoid light. Food balls and oviposition cloth pieces were changed daily till the pairs died. The number of eggs laid by each female was counted daily. To note total production of eggs by each female, the genitalia was dissected after death of females and the eggs present in oviducts were counted.

Results and Discussion

Longevity

Mean duration of lives of male and female *A. grisella* moths fed on different diets is given in Table 1. Mean life of male irrespective of any diet was longer than that of a female. Comparison of longevity of male moths on different diets showed that they lived longest when fed on glucose solution or honey solution. Life of a male moth fed on mixture of yeast, glucose and honey was comparatively longer than that fed on simple water and control. Statistical analysis showed that there was no significant difference in duration of lives on male moths in different treatments. Thus the glucose solution; honey solution; and mixture of yeast, glucose and honey appeared to be equally good for the longevity of male moths.

The life of female moth was longest on mixture of yeast, glucose and honey (Table 1), followed by that on honey solution and glucose solution. It was comparatively shorter on simple water and control. 'F' Test showed that the four treatments were significant at 1% level. To see the significance among the treatments pairs t-test was applied which indicated that at 5% level mixture of yeast, glucose and honey was significantly different than all other treatments and being maximum in value could be taken as a best treatment for longest life of female *A. grisella* moth.

Fecundity

The females laid maximum number of eggs when fed on mixture of yeast, glucose and honey and the minimum when no food was given. 'F' Test showed that the treatment were highly significant. To see the significance among different treatments pairs t-test was applied which indicated that at both 5% and 1% levels mixture of yeast, glucose and honey was the best treatment. This was followed by glucose solution and honey solution treatments but these were not significantly different from each other. Similarly fecundity of female moths fed on simple water was not significantly different from that of moths not given any feed.

From the foregoing paragraphs it could be concluded that the diets used in the study affected both the longevity and fecundity of *A. grisella* moths. Though the males fed on the same diets showed slightly different tendency, they were not as important as the females and as such could be provided any of the diets.

Female moths lived longest and laid maximum number of eggs when provided mixture of yeast, glucose and honey on account of this being nearest to the natural food. The decline in longevity and fecundity appeared to be due to deficiency of certain nutrients in those. Thus the mixture of yeast, glucose and honey was the best diet for higher production of *A. grisella* in the laboratory. These results are in line with the studies of El-Borollosy *et al.* (1973), Hasanein *et al.* (1970ab).

Table 1: Effect of different diets on longevity and fecundity of *Achroia grisella* moth

Treatment	Male Longevity (days)	Female longevity (days)	Fecundity (No. of eggs)
Glucose solution (T_1)	11.6bc	6.7abc	568.9c
Honey solution (T_2)	11.7c	7.0bc	456.1b
Mixture of glucose, honey and yeast (T_3)	9.4abc	8.6d	769.5d
Water (T_4)	8.3ab	5.7ab	380.8b
No food supply, control (T_5)	7.1a	5.4a	286.0a
F. ratio	3.10*	8.26*	43.86**
S.E.	1.15	0.44	28.15

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