protein fractions of interest, that is 43 kD from the *D. n. nasuta* and 35 kD from *D. n. albomicans*, will be transfered to polyvinlidene difluoride (PVDF) membrane, that will be used for N-terminal amino acid sequencing.

Conclusion

It is an important genetic approach to understand the X-chromosomal glue protein genes in *Drosophila nasuta nasuta.*

Acknowledgment: The authors thank Department of Science & Technology, Government of India for financial support.

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Male age influence on sons mating success in low and high larval densities in *Drosophila bipectinata.*

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A great diversity of male traits is known to influence on female mating decisions. One male characteristic that has received a lot of attention as a possible cue for female mate preference is age (Beck *et al.,* 2002). The success of males in achieving mating is often linked to the reproductive benefits which females derive (Bussiere *et al.,* 2005). Males typically vary in their ability to provide benefits and determining how females detect which males have to offer has revealed much about the processes that drive the evolution of mate choice. Females often use phenotypic cues that serve as indicators of mate choice benefits (Jacot *et al.,* 2007).

Different models were proposed for female preference for males of different age classes. Both theoretical and empirical evidence of female preference for male age has demonstrated preferences for old, young, and even middle aged males in a variety of species (Jones *et al.,* 2000; Brooks and Kemp, 2001), and much research has been devoted to understand the benefits females derive from mating with males of particular age. Trivers (1972) and Halliday (1978) offered the first verbal arguments of age as an important factor affecting female mate choice. They stated that all conditions being equal, females should prefer older males, since they have demonstrated their capacity for survival. A few years later, Manning (1985) proposed that older males carry fewer somatic mutations than young males, since selection would have removed individuals with deleterious mutations early in life. Thus, older males are genetically superior, and females who mate with such males would be benefited by passing on those genes to their offspring. This theoretical proposition needs experimental evidence. To validate Manning's (1985) hypothesis, influence of male age on sons' mating success in low and high larval density has been studied using *Drosophila bipectinata.*

Experimental stocks of *D. bipectinata* established from isofemale line collected at Mysore were used. Forty flies (20 males and 20 females) of this line were cultured in quarter pint milk bottles (250 ml) containing wheat cream agar medium at 21 ± 1ºC, relative humidity of 70%, and 12:12 L:D cycle. After three generations of culture, eggs were collected separately from each of the above stocks using Delcour's (1969) procedure. Eggs (100) were seeded in vials (3″x1″) containing wheat cream agar medium. When adults emerged from these vials, virgin females and unmated males were isolated within 3 h of their eclosion and were aspirated into new vials containing wheat cream agar medium. These flies were aged as required for the experiment [young age male (2-3 days); middle age male (24-25 days); old age male (46-47 days)]. These males of different age classes were maintained individually in a vial containing wheat cream agar medium using the same laboratory conditions. These males were transferred to fresh vials once a week until they were used in the experiment. Female flies were also aged for 5-6 days and were maintained using above laboratory condition. Offspring were obtained separately by crossing each of the three male age classes with 5-6 days old virgin females. Eggs were once again collected separately from each of the above crosses using Delcour's procedure (1969). To create low larval densities, eggs (100) were seeded in a vial (3″x1″) containing wheat cream agar medium; for high density 400 eggs were seeded in such vial. When adults emerged from these crosses, virgin sons were isolated as above. At the same time 5-6 days virgin females were also obtained from main experimental stock to study male age influence on sons mating success in low and high larval densities.

In multiple mating experiments, five 5-6 day old virgin females (obtained from main experimental stock) and five each of 5-6 day old unmated sons of young and old/young and middle /middle and old age male were aspirated individually into an Elens-Wattiaux (1964) mating chamber. Thoraxes of five young males were painted with Indian ink in one trial, while in another five old age were painted. Observation was made for 1 hr. When mating occurred, pairs in copulation were aspirated out of the mating chamber without disturbing other flies in the chamber. A total of 10 trials were made for each combination of multiple mating experiments, and the number of mated pairs was recorded. The mating success data were subjected to Chi-square analysis.

In pair-wise mating, a virgin 5-6 days old female (obtained from main experimental stock) and one 5-6 days old son of different male age classes (young, middle, old age) were aspirated individually into an Elens-Wattiaux (1964) mating chamber. Observation was made for 1 hr, and a total of fifty trials were made for each of the sons of different age classes. The total number of pairs mated in 1 hr was recorded.

Table 1 shows son's mating success of different male age classes in low and high larval density. In low larval density, mating success of sons of old age males was 80% (n = 50) when young and old age males were involved in the crosses. Similarly 50% of sons of old age males were successful in crosses involving middle and old age males. In crosses involving middle and young aged males, sons of middle aged males were more successful (76%) than the other. Similar result was obtained at high larval density also. Even in the pair wise mating (Figure 1), sons of old aged males had highest mating success (90%; n = 50) followed by sons of middle aged males (68%) and sons of young aged males (54%), respectively. In high larval density also sons of old aged males had the highest mating success (94%), followed by sons of middle aged males (64%) and sons of young age males (50%), respectively. This shows that even in pair wise mating, sons of old age males had greater mating success than sons of middle and young age males.

Table 1. Mating success of sons of different male age classes in low and high larval density in *D. bipectinata* using multiple choice experiment.

Density	Female	Son		χ^2 value	Son		χ^2 value	Son		χ^2 value
		Young age male	Old age male		Old age male	Middle age male		Middle age male	Young age male	
Low larval density	5-6 days	10 (20%)	40 (80%)	18.00*	30 (60%)	20 (40%)	2.00^{ns}	38 (76%)	12 (24%)	13.52*
High larval density	5-6 days	12 (24%)	38 (76%)	12.50*	30 (60%)	20 (40%)	2.00^{ns}	37 (74%)	13 (26%)	8.00*

* P < 0.001; ns = insignificant

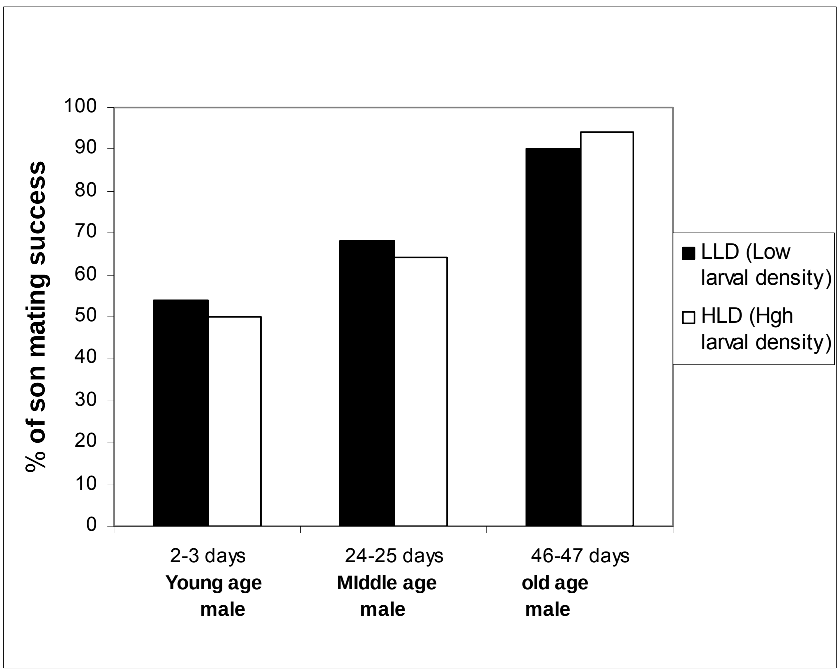

Figure 1. Percentage of mating success of sons of different male age classes in low and high larval density in *D. bipectinata* using no choice experiment.

This result supports the idea that the selective advantage of female choice is based on indirect fitness benefits. Our results do not support the findings of Avent *et al.* (2008), who while working on *D. pseudobscura* have found that virgin females obtained from main culture bottle did not discriminate sons of young and old age males. Even in *D. melanogaster* offspring of older father have reduced mating ability (Price and Hansen, 1998). Therefore, our results do not run counter to the hypothesis that sons of older males should be less successful in obtaining mates than those of young males, because the older males pass on sperm with increased number of germ line mutations (Price and Hansen, 1998).

In the present study, sons of young, middle, and old age males when used were 5-6 days old and they were unmated. They were reared in the same environment. Therefore, greater mating success of sons of old age males could not be attributed to differences in the life history or rearing conditions.

In the present study it was also noticed that in both multiple mating and pair wise mating experiments, son's mating success was greater in low larval density compared to high larval density. This supports the earlier studies on the influence of larval density on fitness trait in *Drosophila* (Barker and Podger, 1970). Thus, these studies in *D. bipectinata* suggest that females of D. *bipectinata* preferred old age males to obtain sons having greater mating success which is independent of larval density.

Acknowledgments: The authors are grateful to the Chairman, Department of Studies in Zoology, University of Mysore, Manasagangotri, Mysore – 5700 006, India for facilities, and University Grant Commission, New Delhi (F. No. 36-277 / 2008 (SR) dated 26 March 2009) for financial support.

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Effect of sevin on mating behavior of *Drosophila melanogaster*.

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Abstract

Behavioral toxicity of systematic pesticide Sevin has been tested in *Drosophila melanogaster* by larval feeding technique. Larvae of same age 72 ± 4 h were grown in the wheat agar media mixed with different levels of Sevin, and the effect of the pesticide was analyzed by observing mating behavior of *Drosophila*. Key words: Sevin, Mating behavior, *Drosophila*.

Introduction

Pesticides are deliberately added to the environment to combat target species. But nontarget species (Bhunia *et al*.,1994; Elliot *et al*.,1996; Green *et al*.,1994; Johan and Prakash.,1997; Krishnan and Ravi,1994; Marton,1974; Oleolzska and Sikorski,1991; Rao *et al*.,1994; Tanaka *et al*.,1996) including man also affected. Carbaryl causes behavioral and neurological problems (Dsi,1974; Anger and Setzer,1979; Branch and Jacqz,1986) in exposed animals. Hence, the present work was intended to understand the mating behavior of *Drosophila melanogaster* under the influence of Sevin.

Materials and Methods

Commonly used systematic pesticide sevin (CAS No.63-25-2) was selected. Local *Drosophila melanogaster* has been tested at 25 ± 1ºC and RH 60%. The same aged larvae (72 ± 4 h)