Various laboratories have reported long-lived strains of *Drosophila* using natural and artificial selection experiments. The long lifespan strains isolated in different laboratories are useful in unraveling the basic mechanisms of aging. According to free radical theory of aging (Harman, 1956), the "aging results from the deleterious effects of free radicals produced in the course of cellular metabolism." Luckinbill *et al.* (1984) and Arking (1987) made artificial selection to generate long-lived strains of *Drosophila* and compared them with the normal-lived progenitor strains. Selection for altered longevity was carried out by permitting reproductive success to occur at different times during the lifespan. Caloric restriction has been known for the past 75 years to be involved in extension of lifespan in rodents and *Drosophila*, and this attribute is conserved from yeast to rats (McCay *et al.*, 1989). Longevity strains have also been isolated through direct selection for delayed female fecundity (Luckinbill *et al.*, 1984; Arking, 1987; Partridge and Fowler, 1992). There are also reports of direct selection for desiccation resistance (Hoffmann and Parsons, 1989) or starvation resistance (Rose *et al*., 1992) and thereby indirectly selected for extended longevity. Many transgenic experiments have been carried out to test antioxidant theory of aging, which exhibited resistance to stress-inducing compounds and showed increased lifespan. Several laboratories have shown various characteristics of the long-lived strains, which include increased lipid content, increased starvation and desiccation resistance, longer flight duration, high glycogen content, higher stress resistance, and so forth (*c.f.*, Arking, 2005). Therefore, longevity is associated with many factors. The LLS strain we have isolated will be useful to investigate the factors that influence extended lifespan when compared with the NLS strain, particularly with reference to oxidative stress and antioxidant enzymes.

Acknowledgment: We thank The Chairman of the department for the facilities. The first author thanks Department of Science and Technology, Govt. of India, for financial support under INSPIRE Program.

References: Arking, R., 1987, Exp. Gerontol. 22: 199–220; Arking, R., 2005, Ann. N. Y. Acad. Sci. 1057: 16–27; Arking, R., V. Burde, K. Graves, R. Hari, E. Feldman, A. Zeevi, S. Soliman, A. Saraiya, S. Buck, J. Vettraino, K. Sathrasala, N. Wehr, and R.L. Levine 2000, Exp. Gerontol. 35: 167–185; Arking, R., A.G. Force, S.P. Dudas, S. Buck, and G.T. Baker, III 1996, Exp. Gerontol. 31: 623–643; Bharathi, N.S., N.G. Prasad, M. Shakarad, and A. Joshi 2003, J. Genet. 82: 191–205; Harman, D., 1956, J. Gerontol. 11: 298–300; Hoffmann, A., and P. Parsons 1989, Genetics 122: 837–845; Luckinbill, L.S., R. Arking, M.J. Clare, W.C. Cirocco, and S.A. Buck 1984, Evolution 38: 996–1003; McCay, C.M., M.F. Crowell, and L.A. Maynard 1935, Nutrition 5: 63–79; Paaby, A.B., and P.S. Schmidt 2009, Fly 3: 1–10; Partridge, L., and K. Fowler 1992, Evolution 46: 76–91; Rose, M.R., L.N. Vu, S.U. Park, and J.L. Graves 1992, Exp. Gerontol. 27: 241–250; Tyler, R.H., H. Brar, M. Singh, A. Latorre, J.L. Graves, L.D. Mueller, M.R. Rose, and F.J. Ayala 1993, Genetica 91: 143–150.

Importance of non genetic factor (male age) in mating success of *Drosophila bipectinata.*

Krishna, M.S.,*[1] S.C. Jayaramu,[2] and M. Prathibha.[2] [1]Drosophila Stock Center, Department of Studies in Zoology, University of Mysore, Manasagangotri, Mysore 560 006, Karnataka, India; [2]Yuvaraja's college, University of Mysore, Mysore; * Corresponding author

Mating success is one of the fitness components in *Drosophila*. Numerous studies have shown the genotype dependent mating success (Spiess, 1970). However, non-genetic factors may also influence the mating success too such as temperature, larval density, and others.

For example, when *D. pseudobscura* is raised at low temperatures, males are larger and are more successful in mating than males of the same strain raised at high temperature (Ehrman, 1972). Similarly to larval density, age is known to influence mating success in *Drosophila* (Krishna *et al*., 2012). Recently in *D. bipectinata* it was noticed when females of *D. bipecinata* were given a choice to select young and old males, she preferred old males more frequently than young ones (Somashekar and Krishna, 2011). Therefore, in the present study we used brown eye mutant of *Drosophila* to test the female preference for male age classes to understand the relative importance of male age in mating success.

Flies used in the present study included the brown eye mutant originated by spontaneous mutation (Hegde and Krishna, 1995) in the natural population collected at Mysore in Chamundi hills. Eggs were collected from this stock using Delcour procedure (1969). Samples of 100 eggs were seeded in a culture bottle containing wheat cream agar medium and were maintained at 22±1°C and a relative humidity of 70%. When flies emerged, virgin females and males were isolated. Males were aged for 2-3 days (young) and 32-33 days (old); and 5-6 days virgin females were used for the female choice experiment. To study female choice experiment, a 5-6 day old mutant / wild female with two males (young and old) were introduced into an Elens Wattiaux mating chamber (1964) and observed for 1 hr. A total of 50 trials were made for each combination, and mating success of young and old age males were recorded.

Table 1. Male age influence on mating success of brown eye mutant and wild type flies of *D. bipectinata.*

Female	Males	Female mated with young males	Females mated with old age males	χ^2
5-6 days (W)	Young (M) Old (M)	15	35	8.00*
	Young (W) Old (W)	17	33	5.12*
	Young (W) Old (M)	9	41	20.48*
	Young (M) Old (W)	8	42	23.12*
5-6 days (M)	Young (M) Old (M)	17	33	5.12*
	Young (W) Old (W)	20	30	2.00^{NS}
	Young (W) Old (M)	10	40	18.00*
	Young (M) Old (W)	7	43	25.92*

* Significant at 0.001 level; NS- Non significant

Table 1 reveals that when wild females of *D. bipectinata* were given an opportunity to mate with young or old age males, irrespective of the genotype, females prefer to mate with old age males more frequently than with young age males. Even in trials of mutant females, females preferred to mate with old age males irrespective of mutant or wild males. This suggests that age of the male is important for mating success in *Drosophila bipectinata.* This study also supports influence of both genetic and non-genetic factors on mating success.

Acknowledgment: Authors are grateful to the Chairman, Dept. of Studies in Zoology, Univ. of Mysore, Mysore, and Drosophila Stock Center for providing facilities.

References: Spiess, E.B., 1970, Appleton-Century-Crofts, New York, 315-379; Ehrman, L., 1972, Behav. Genet. 2: 69-78; Krishna, M.S., H.T. Santhosh, and S.N. Hegde 2012, Zool. Stud.

51(1): 72-84; Somashekar, K., and M.S. Krishna 2011, Zool. Stud. 50: 1-15; Delcour, J., 1969, Dros. Inf. Serv. 44: 133-134; Elens, A.A., and J.M. Wattiaux 1964, Dros. Inf. Serv. 39**:** 118-119.

Female size does not determine ovariole number in *Drosophila*.

Krishna, M.S., S.C. Jayaramu, and H.L. Venkatesh. Drosophila Stock Centre, Department of Studies in Zoology, University of Mysore, Manasagangotri, Mysore-6, India. *Corresponding author: drosokrish@gmail.com

Introduction

Body size in animals is an important trait associated with the reproductive success. It is generally believed that larger the individuals greater is the fitness, *i.e*., larger females can carry more ovarioles than small females. Thus fitness in general is believed to be an increasing function of body size in animals, particularly among insects (Krishna and Hegde, 2003). Although strong positive effects of body size on fitness are wide spread, there is a growing list of studies reporting no effect or even negative on body size effect on fitness components (Wayne *et al.*, 2006). However, studies within and among populations of the same species have produced conflicting results regarding the relationship between female size and fecundity through ovarioles number (Lefranc and Bundgaard, 2000; Wayne *et al.*, 2006). There is a growing list of evidence suggesting that the relation between female size and ovarioles number is not positive and it varies from time to time as it is positively associated with availability of nutrients. On the other hand, the relationship between ovariole number and fecundity was significantly stronger as compared to relationships between fecundity and female size (Branquart and Hemptinne, 2000). As more species are studied the number of examples where female size and fecundity Chenoweth *et al*, 2007) and female size and ovariole number are uncorrelated is increasing (Togashi and Life, 2007). In contrast to this, there is a strong positive relation between ovariole number and fecundity (Branquart and Hemptinne, 2000). Therefore, the present study has been undertaken in three species of *Drosophila*, namely *D. bipectinata, D. ananassae*, and *D. melanogaster*, to study the relation between female size and ovariole number.

Methods

Establishment and maintenance of experimental stocks

Three *Drosophila* species, namely *D. bipectinata*, *D. ananassae*, and *D. melanogaster*, were used in the present study. All experiments were made separately for each of the three species. Experimental stocks of each of the above species were originated separately from 150 wild caught females collected at Mysore, Karnataka. When progeny appeared, flies were mixed together and redistributed to different culture bottles each with twenty pairs. These stocks were maintained using wheat cream agar medium in a constant temperature (21±1ºC) at a relative humidity of 70% under 12:12 light dark cycle. In every generation, flies multiplied in different culture bottles were mixed together and eggs were collected using Delcour procedure (1969). Eggs (100) were seeded in fresh quarter pint milk bottles with 25 ml of wheat cream agar medium to avoid larval competition during development (this procedure allowed us to reduce environmental variation in size). After, five