Mutation Notes

A new mutation in *Drosophila malerkotliana.*

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Drosophila malerkotliana, which was described by Parshad and Paika from Punjab, India, in 1964, belongs to the *bipectinata* species complex of the *ananassae* subgroup of the *melanogaster* species group (Bock and Wheeler, 1972). On the basis of abdominal tip pigmentation in males, *D. malerkotliana* has been classified into two allopatric subspecies, namely, *D. m. malerkotliana*, black abdomen, and *D. m. pallens*, yellow abdomen (Singh and Sisodia, 2008). This species shows incomplete sexual isolation with other members of the *bipectinata* complex (Bock, 1978; Singh, *et al.*, 1981, 1982; Singh and Chatterjee, 1991). Similarly, *D. malerkotliana* shows asymmetrical sexual isolation with *D. parabipectinata* (Banerjee and Singh, 2012). Chromosomal polymorphism has also been studied, and inversions are known to occur in natural populations of *D. malerkotliana* (Bock, 1971; Rahman and Jha, 1973; Tomimura *et al*., 2005). Similarly, persistence of chromosome inversions in laboratory stocks of *D. malerkotliana* was observed by Banerjee and Singh (1995). Behavioral studies have been documented to some extent in this species (Hegde and Krishna, 1997, 1999; Singh and Singh, 2013). Several induced and spontaneous mutations have been reported in this species (Srivastava and Singh, 1995; Siegal *et al*., 2004).

A large number of stocks of *D. malerkotliana* established from flies collected from different geographical localities are being maintained in our laboratory. This note describes an x-ray induced mutation in *D. malerkotliana*. For irradiation experiments the males were taken from a wild type stock collected from Punjab, India, and raised for many generations in the laboratory. The newly hatched males were collected. For irradiation 50 males were irradiated immediately and 50 males were aged for two days and then given radiation. These males were kept in a gelatin capsule and were exposed to X-rays under following conditions:

Target distance – 50 cm
KVP – 120 KVP
Dose rate – 400 r per minute
Total dose given - 1600 r in 4 min.

In each experiment 50 males were irradiated under similar conditions. The newly hatched wild type irradiated males were allowed to grow at least for 2 to 3 days and were then mated for four days with a first set of 40 virgin females (wild type). Similarly, two days old irradiated males were immediately mated with 50 four days old virgin females. After four days these males were separated and mated with another set of 40 wild type virgins. Again after four days these males were separated and mated again with another set of 40 wild type virgin females. After 12-16 days F_1 progeny were collected from all the bottles and observed for any variant. Pair mating was made from these F_1 flies in food vials. F_2 progeny from food vials were carefully examined for any variations from the wild type.

In one of the vials, six males showing brownish eye color were observed. The brownish eye color in these males shows resemblance with *garnet* eye color, a sex linked mutation of *D. ananassae* reported by Hinton (1980). These males were crossed with wild type females and the resulting progeny from this cross were normal. When these flies were pair mated, some of the males obtained from this cross showed *garnet* eye color. These males were pair mated with females from the same cross, which resulted in the production of *garnet* eye color females. A separate homozygous line was established by using females and males showing *garnet* eye color. In order to test the inheritance pattern, virgin *garnet* eye color females were collected from the stock and mated with wild type males. All the F_1 males showed *garnet* eye color demonstrating sex linked inheritance. Figure 1 shows a mutant male with *garnet* (*g*) eye color. Thus it is concluded that *garnet* eye color mutation in *D. malerkotliana* is a sex linked recessive mutation that was induced by X-rays. It is a new mutation being reported for the first time in this species.

Figure 1. Garnet eye color phenotype in *Drosophila malerkotliana.*

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New spontaneous wing mutant *curly* in *Drosophila willistoni* strain GdH4-1.

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