

A new mutation in *Drosophila parabiepectinata*.

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D. parabiepectinata was described by Bock in 1971 and is one of the members of the *D. biepectinata* complex, which is comprised of four closely related and morphologically very similar species: *D. biepectinata*, *D. parabiepectinata*, *D. malerkotliana*, and *D. pseudoananassae*. This complex is part of the *ananassae* subgroup of the large *melanogaster* species group (Bock and Wheeler, 1972) of the subgenus *Sophophora*. These species occur throughout Southeast Asia, extending into north eastern Australia, the Indian subcontinent and South Pacific. However, *D. parabiepectinata* has restricted geographical distribution as compared to the other three species of the complex. All the four species are sympatric over most of their geographic ranges. All the four species hybridize with each other in the laboratory, and hybrid females are fertile but males are sterile (Mishra and Singh, 2006). *D. parabiepectinata* shows incomplete sexual isolation with other members of the *biepectinata* complex (Bock, 1978; Singh *et al.*, 1981; Banerjee and Singh, 2012). It shows asymmetrical sexual isolation with *D. biepectinata* and *D. malerkotliana* (Banerjee and Singh, 2012). Results based on interspecific crosses and behavioral studies provide evidence that *D. biepectinata* and *D. parabiepectinata* are very closely related species (Bock, 1978; Hegde and Krishnamurthy, 1979, Crossley, 1986; Singh and Singh, 2013, 2014).

A large number of stocks of *D. parabiepectinata* established from flies collected from different geographical localities are being maintained in our laboratory. This note describes an x-ray induced mutation in *D. parabiepectinata*. For irradiation experiments, the males were taken from a wild type stock collected from Mysore, India, and reared for numerous generations in the laboratory. The newly hatched and two days old wild type males were collected, and these males were kept in a gelatine capsule and were exposed to X-rays under following conditions:-

Target distance – 50 cm

KVP – 120 KVP

Dose rate – 450 r per minute

Total dose received approximately - 1800 r in 4 min.

In each experiment, 50 males were irradiated under similar conditions. The newly-hatched wild irradiated males were allowed to grow for at least 2 to 3 days and were then mated for four days with a first set of 40 virgins (wild type). Similarly 2 day old irradiated males were immediately mated with 50 four day old virgin females. After four days these males were separated and mated with another set of 40 wild 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, F₁ progeny were collected from all the bottles and observed for any variant. Pair mating was made from these F₁ flies. F₂ progeny from vials were carefully examined for any variations from the wild type.

Six males were obtained in one of the vials which showed brownish eye color appearance that resembles *garnet* eye colour sex linked recessive mutation of *D. malerkotliana* (Singh and Singh, 2013). They were crossed with wild type virgin females. Next generation progeny were normal and, when they were pair mated, some of the male progeny showed *garnet* eye color. By making pair matings from these flies, mutant females and males were obtained and a separate stock of *garnet* eye color could be established. In order to confirm the inheritance pattern, virgin *garnet* eye color females of *D. parabiepectinata* were collected from the stock and were mated with wild type virgin males. All the F₁ males showed *garnet* (g) eye color phenotype (Figure 1) showing sex linked inheritance. This is the first report of phenotypic marker in this species.

The *garnet* eye color of *D. parabiepectinata* shows resemblance with that of *garnet* eye color mutation of *D. malerkotliana* (Singh and Singh, 2013). Since both the species belong to the *biepectinata*

species complex and are closely related and same mutation has been induced by X-rays, the loci may be very susceptible to X-rays in both the species.

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