FIVE DOUBLE RECESSIVE EYE COLORS IN DROSOPHILA

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Since the last report on the production of combination eye-colors in *Drosophila melanogaster* at Purdue[1], several others have been produced as follows: (1) White, Brown; (2) Garnet, Brown; (3) Garnet, Sepia; (4) Vermilion, Sepia; (5) Brown, Sepia.

It should be noted that of the first four of these, each involves a pair of sex-linked factors and a pair of non sex-linked factors whereas in the Brown Sepia combination, both pairs of factors are non sex-linked.

The method of producing the first four combination eye-colors was the same as that used by Romberger in the production of White Sepia and described in considerable detail in his paper[1]. The method of producing Brown Sepia was very similar, involving only certain changes made necessary by the fact that both Brown and Sepia are non sex-linked. All combinations were tested by mating to each simple color involved in the combination. They proved to be homozygous for both characters by the fact that the simple color appeared in the F_1 generation. For example, a cross between Brown Sepia and Brown gave brown, but a cross between Brown Sepia and Sepia gave sepia.

These double recessive combination eye-colors have the following phenotypic characteristics.

"White, Brown." Individuals homozygous for this combination are classified as phenotypically white-eyed flies. When compared with the common white mutant however, it is easily detected that the eye contains pigment. The whole of the eye has a slight light buff or cream color, and the central region seems to possess more color than the outlying facets. This character could be mistaken easily for white if there were none of the latter near for a direct comparison.

"Garnet, Brown." Garnet is masked by brown which is indistinguishable from the color of the brown-eyed stock. The newly emerged flies appear light but soon darken to a distinct brown color.

"Garnet, Sepia." The garnet eye-color again is masked, but this time by sepia. The darkening in the color of the eye after emergence is very similar to that which occurs in the sepia stock.

"Vermilion, Sepia." These flies are phenotypically sepia eye-colored after aging, but the newly emerged flies exhibit a very peculiar lemon eye-color. This startling bright color caused attention to be drawn their way, and they were suspected of being the double recessives when they first appeared. As they become older, there is a deeping of the pigmentation of the eye which necessitates approximately 48 hours to effect a complete transformation to sepia.

"Brown, Sepia." In this case sepia is masked by brown, the flies of this strain being practically indistinguishable from those of the brown stock.

As yet is does not seem possible to generalize concerning the interactions taking place between eye-color factors.

[1] Romberger, Floyd T., Jr. The Masking of Sepia by White, Two Recessive Eye Colors in Drosophila. Proc. Ind. Acad. Sci. 42:261-267. 1933.