

1. Viviparous₁ has been located as to chromosome with the aid of TB - 3a. An F₁ ear of a heterozygous *vp*₁ plant pollinated by TB-3a pollen was observed to be segregating viviparous seeds. This places *vp*₁ in the distal 9/10 of the long arm of chromosome 3 which is the portion of three translocated to the B centromere. Backcrosses of plants heterozygous for *wx* - T3-9a - *vp*₁ and *wx* - T3-9c - *vp*₁ to *wx vp*₁ produced 13.1% and 10.7% crossing over respectively between *wx* and *vp*₁. Anderson (Genetics 23:307-313, 1938) reports 3.6% crossing over between T3-9c and *wx* and 7.6% crossing over between T3-9c and *wx*. The difference between the T-*wx* distances and the *wx-vp*₁ distances should approximate the crossover values expected between the translocations and *vp*₁. This value is 9.5% for T3-9a and 3.1% for 3-9c.

Homozygous *vp*₁ seeds do not develop aleurone color in the presence of the genes *A*₁, *A*₂, *C* and *R*. There are two possible explanations for the absence of color in these seeds; 1) it could be the result of some direct action of *vp*₁ upon the formation of the aleurone pigment or 2) the gene could act by first inducing premature germination which in turn prevents the formation of color in this layer. The cross with TB-3a suggests that the first hypothesis is correct. The seeds in this cross all carried the genes *A*₁, *A*₂, *C* and *R*. However, the viviparous seeds instead of having colorless aleurones were colored while some of the dormant seeds were colorless. Thus, it is probable that the lack of color in the aleurone is not caused by the premature germination but rather is the result of some more direct action of *vp*₁. If this is true, then the viviparous seeds with colored aleurone in the above cross result from the union of polar nuclei with a hyperploid sperm carrying *Vp*₁ in duplicate while the deficient sperm (deficient for the *vp*₁ locus) unites with the egg nucleus. The dormant colorless seeds result from the reciprocal fusions. (In both of these classes of seeds the ovules functioning in fertilization carry *vp*₁.) The cross with TB-3a also suggests that *vp*₁ is similar to *vp*₅, *vp*₇ and *vp*₈ in that vivipary is determined by the genotype of the embryo and is independent of the genotype of the endosperm.

The following linkage information on several of the other viviparous mutants has been obtained.

*vp*₂

*vp*₂ - (4.0)* - *bm*₁ - 19.0 - *pr*

*vp*₂ - 1.1 - T4-5i

*This is a maximal value. Non-viviparous ears in this crossover class will need to be tested further.

*vp*₅

wx - 3.98 - T1-9e - 25.9 - *vp*₅

*vp*₉

wx - 5.4 - T5-9_{a76} - 20.8 - *vp*₉

*vp*₉ - 8.5 - *gl*₁

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