

The data indicate that the two c^P alleles present in W22 and K55 c testers have essentially the same effects. The materials used for K55 c^P were from very weak inbred ears, and this may be the reason for the higher cy/pg ratio observed in K55 c^P tissue. There seems to be a general trend such that the more vigorous the germinating seed, the lower the cy/pg ratio.

It is clear that there are two allelic forms present in c testers: c^P , the conditional colored, and c^n , the colorless. Light and germination are two required conditions for anthocyanin formation in the c^P tissue. The pigments formed in c^P tissue have a lower cyanidin/pelargonidin ratio than that in normally pigmented C tissue.

Shu-mei Chen

2. An unsuccessful search for mutations affecting anthocyanin distribution.

Large populations of one inbred line, Ky 27, grown in isolation, have been observed closely for mutations of factors controlling anthocyanin distribution. This inbred is $A C r^R$ and has purple plumule; a search was conducted in the plants and in the seeds produced on them for pigment formation in new locations--for example, in culm, husk, glume bar, and aleurone tissue. Among more than 10,000 plants studied, no distinctive plants or sectors were found; among 3.62×10^6 kernels, several colored contaminations were identified, but no valid mutations were found, either as whole-kernel exceptions or as sectors down to the limit of naked-eye resolution. Considering that any single mutation-competent locus (for example, r^R) is present in the aleurone in 3 doses (i.e., 10.86×10^6 chromosomes entering into the triple fusion), and that the twofold observation protocol used here should identify events through at least the first ten divisions (i.e., 10^3 sites for minimum detectable mitotic events; 10^6 mitoses per kernel), no mutation to anthocyanin synthetic capacity was found in around 10^{13} mitotic replications. This observing load was lightened by the help of Paul Bolen, Shu-mei Chen, John Cousins, Kenneth Hall, Henry Lee, Marion Murray, Donald Smith, Jean Spengel, and Charles Williamson.

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