3. An alternative to Vavilov's thesis of the meaning of the center of diversity.

Vavilov proposed that the center of diversity of a species might well be the center of origin of the species. The insight being that the peripheral areas represent the migration of the population to less selectively compatible environments--pioneering, as it would be called.

An alternative to this idea is simply that the center of diversity represents solely that region which exerts the least negative selection on the gene pool and heterogeneity can accumulate. This does not suggest center of origin. It is easier to picture the major evolutionary steps taking place in peripheral areas (not necessarily geographic but rather environmental). With introgression, selected mutation, etc. representative migrants return to the non-selective environment and join with other "returning migrants" to interbreed in an "open" non-selective environment where genetic diversity is not eliminated as in the more selective peripheral environments.

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4. In defense of the thesis that R^{nj} is an R gene plus a pattern gene.

Both Brink (M.N.L. 34:122) and Kermicle (M.N.L. 41:199) have presented evidence that R^{st} (a spotting R allele) can recombine with R^{nj} (aleurone pigmented only at top of kernel) and result in an aleurone phenotype of spots limited to the top portion of the aleurone and the base colorless, typical of a Navajo pattern. This contrasts with the Navajo and Stippled elements in repulsion which yield a typical R^{nj} phenotype at the top of the kernel, and R^{st} spotting at the base of the same kernel.

What follows argues for the compound nature of R^{nj} on a functional basis rather than on a recombinational one.

In a mating of R^{nj}/R^{nj} ♀ X R^{r}/R^{r} ♂ all of the resultant kernels were fully and uniformly pigmented. If the R component of R^{nj} was non-functional in the basal cells, kernels with full pigment at the crown and mottled pigment at the base would have been expected (single dose of R via the male). Finding only fully pigmented kernels suggests that the R (aleurone pigmentation) component of R^{nj}, though not producing pigment in the basal region of the kernel itself, interacts with the R^{r} gene (a potential mottle) which then produces uniform pigment development. Most likely the R^{r} allele is responsible for the basal pigment rather than the activation of the R component of R^{nj}. In R^{nj}/R^{st} heterozygotes, only spots are found in the basal portion of the kernel and not uniform pigment. The R component of R^{st} does not stimulate R^{nj} to express itself at the base of the kernel but the R component of R^{nj} does stimulate a potential R-mottled allele to produce uniform pigment.

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