PALE AXIL COLOR

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In 1984 (1) I reported the segregation for orangy pink axil color, a phenotype resembling the effect of b, but which is independent of b. Thus, pink axils are produced in a B (wild-type) background. This observation was reported in an article which focused on seed pigmentation pattern so the subject of axil coloration was noted only in passing, Recently, however, evidence has come to light indicating that the pale axil color at issue here is closely associated with the D locus on chromosome 1.

One of the two segregating populations reported in the 1984 article) was grown in the glasshouse where the segregation for axil color was noted and recorded. Segregation for alleles at the D locus was also noted and recorded but at that time it was not noticed that a strong association existed between D^w and dark (wild-type) axil color on the one hand and D^{co} and pale axil color on the other. So strong was the association that there were no certain exceptions. A field-grown F_2 population deriving from the exact same cross as the glasshouse-grown population also segregated for D^w/D^{co} and for dark/pale axil color but unfortunately this population was not scored for either segregating trait. However, F3 descendants from individual field-grown F_2 plants were grown in the glasshouse and these were scored for D^w-D^{co} and for axil color. Again, a strong correlation between the two variables was evident.

Upon tracing the pedigrees of the various lines leading to the cross showing segregation for axil color, it was discovered that the apparent origin of pale axil color in this case is WL 578, a line obtained from Dr. Blixt. WL578 is listed by Blixt as having the following constitution: b k_ pre wb ins st td D^{co} mifo s gri cal dem mp pa1 z. I used this line as the type line for pal. Note also that WL 578 also carries b and because of this the axil color is pale. Evidently the action of b obscured the fact that WL 578 also carries the gene that by itself causes pink axils, a gene that is closely linked with the D locus. Linkage rather than pleiotropy is indicated because most D^{co} lines have wild-type axils in an otherwise wild-type background (i.e. B, Am-1, Am-2 etc.).

It would appear that the D locus and the region in the immediate vicinity is important in the regulation of anthocyanin expression. A relationship between D^w and the presence of basal stem anthocyanin production was documented earlier (2) and since that time the relationship has been seen repeatedly.

In a related matter, a cross that has yielded a wide range of distinct and stable flower color phenotypes has also yielded a line with pale pink flower color but with wild-type axil color and seed spotting.

1. Marx, G.A. 1984. PNL 16:43-45.
2. Marx, G.A. and C. Nozzolillo. 1979. PNL 11:25-27.

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