## ANTHOCYANIC LEVELS IN PISUM FLOWERS

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The effects of the genes A, Am, Ar, Ce, and Cr on flower color in Pisum are well-known, at least in qualitative terms (1). During the course of our studies on anthocyanin biosynthesis, we found it necessary to make quantitive determinations of pigment production in the different genotypes. The quantitative data presented in Table I were compiled from a study of Pisum lines available at the University of Tasmania (collection of Dr. I. C. Murfet, plus many Weibullsholm lines). All plants used in the study were grown under glasshouse conditions.

Anthocyanin concentration was determined by reflectance and absorption spectroscopy of individual flower petals or their extract (in acidified methyl alcohol), using a Unicam SP8-100 spectrophotometer, with an integrating sphere diffuse reflectance accessory. The data provided in the table are the mean values obtained for anthocyanin concentration in each genotype expressed as a percentage of wild type.

Attention is drawn to the following points in Table I:

1) In am, ar, and ce lines, the pigment content of the standard petals is consistently about 1/5 - 1/6 the concentration found in the wing petal, as is the case with wild type flowers; cr lines, however, produce relatively more pigment in the standard. s/w = 1/3.

2) As well as producing a qualitative effect (cyanidin in place of delphinidin-type anthocyanin [2]), b causes a marked reduction in the total amount of anthocyanin produced, particularly in the standard petal. This quantitive effect is manifest also when other color genes are recessive.

3) Anthocyanin production is negligible in ce cr lines grown under glasshouse conditions.

1. Blixt, S. 1962. Agri Hort. Genet. 20:95-110.
2. Statham, C. M., R. K. Crowden and J. B. Harborne. 1971. Phytochem. 11:1083.
3. Statham, C. M. 1974. PhD Thesis, University of Tasmania.

Table 1. Relative anthocyanin concentrations in wing and standard petals of different genotypes of Pisum sativum. The number of lines of each genotype used in the study is shown in the column headed n.

| Genotype | Color[1] | Wing | Standard | n |
|---|---|---|---|---|
| A Am Ar B Ce Cr | purpureus, dull dusky purple | 100 | 21 | 7 |
| b | clariroseus, deep rose pink | 26 | 2 | 23 |
| ar | coeruleoviolaceus, nigrosin violet | 102 | 16 | 3 |
| ar b | roseialbus, pale rose pink | 21 | 1 | 9 |
| ce | roseus, cerise | 43 | 7 | 2 |
| b ce | light rose† | 5 | 1 | 2 |
| cr | fuscopurpureus, Indian lake, crimson† | 44 | 14 | 7 |
| b cr | salmon† | 16 | 7 | 2 |
| ar cr | malvaceous, light mauve | 79 | 29 | 1 |
| ar b cr | | 2 | 0.5 | 1 |
| ce cr | palleopurpureus, pale rose pink | 0.1 | < 0.1 | 4 |
| am | pinkish white | 4.5 | 0.7 | 7 |
| am b | | 0.5 | 0.5 | 1 |
| am ar | | 4.5 | 2 | 1 |
| a | white | 0 | 0 | 8 |

[1] Color descriptions marked † refer to Statham (3); all others according to Blixt (1).