PRELIMINARY NOTE ON ORANGE COTYLEDONS: A NEW COTYLEDON COLOR

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Yellow and green cotyledon color, due to dominance and recessivity in *I*, respectively, have been known since the time of Mendel. During routine determinations of the probable genotypes of accessions held in the gene bank at Wiatrowo, a line was found with seeds of a clearly different color. This line, obtained from the Chinese Academy of Agricultural Sciences under the name "Ren-shou da bai Wan dou", was designated as AO 113 by the donor. It was assigned number WT 11145 in the Wiatrowo catalogue. The seed color of the whole seed with seed coat (genotype a.) seemed to be pink, but the cotyledons had more of an orange hue after the seed coat was removed. Because the character was clearly different from the typical expression of gene I the line was immediately crossed with WT 3527. Later we found that the original sample actually contained two types, which we here designate as brick and orange. Interpretation of the F2 segregation presented difficulties from the outset. Despite seemingly clear color differences, it was impossible to establish any regular segregations in orange and yellow observed on whole seeds, i.e., seeds with seed coat. After removing the seed coat from all the F2 seeds, the cotyledons showed a range of hues from yellow to orange. The whole population could be divided into five classes: yellow, dark-yellow, light-orange, orange, and brick-red. Though the differences betweeen neighboring classes were slight, the classes were more or less discrete with little overlapping (Table 1). An interpretation in terms of segregation ratios is not possible because the color of the individual parent plants of Wt 11145 was not ascertained before crossing and we now know that Wt 11145 contains two types. It can only be stated that the segregation non-yellow to yellow is normal 3:1. The character behaves as a cotyledon character, i.e., segregating within the plant as does I or R.

Very recently F^ seeds from three new crosses were obtained (Table 2). These results seem to indicate that brick and orange cotyledon colors may be alleles of I perhaps also showing intermediate inheritance, which would be interesting, as semidominance is not common in Pisum. It is also possible at this stage that the different hues are due to modifying effects of other color genes.

A closer look in wiatrowo'scollection showed some more accessions with the orange cotyledons (e.g., Wt 4401). A first screening of the Weibullsholm collection up to now resulted in at least two different hues of yellow. There is also a very slight indication that "bleaching" might be involved.

We will continue this analysis of cotyledon colors but wanted to publish these preliminary results with the hope it will encourage coleagues to screen their material for possible deviations from ordinary yellow and green. Whatever the results, we would very much appreciate being informed of the outcome and receiving small samples of any such deviating material.

Table 1. Phenotypic distribution of seed color in F_2 populations from reciprocal crosses between a line with orange cotyledons (Wt 11145) and a line with yellow cotyledons (Wt 3527).

Cross	No. of F_2 plants with seeds darker than yellow but in more or less distinct color classes: Brick	Orange	Light-orange	Dark-yellow	Total for darker than yellow	Yellow	TOTAL	Chi-square (3:1)
Wt 11145 x Wt 3527	220	248	245	216	929	317	1246 Found	
					934.5	311.5	1246 Expected	0.13
Wt 3527 x Wt 11145	258	271	369	330	1228	392	1620 Found	
					1215	405	1620 Expected	0.56

Table 2. Results of F_1-generations of different crosses.

	Color: Brick	Orange	Light orange	Dark yellow	Yellow	Green
F_1 Wt 11145 x WL 1267	o	o	x	u		
F_1 Wt 11145 x WL 1393	o	o		x	u	
F_1 Wt 11145 x WL 145	o	o	x			u

Wt Wiatrowo accession number
WL Weibullsholm accession number

x Color of F_1
o Color of Wt 11145
u Color of other (WL) parent