ORANGE POD (orp): A NEW GENE ON CHROMOSOME 2

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A new mutant designated orange pod (org) was recovered from an experiment conducted in 1980 at Wiatrowo. After treating seeds of Wt 3527 (cv. 'Paloma') with a combined dose of 200 r Nf/0.014% NEU (1) a population consisting of 500 M_2 families (10 seeds each) was grown and examined. One of the families produced three plants of the mutant described herein.

In the early stages of development the plants appeared normal. Then, before the plants reached the flowering stage, the basal portion of the stem began to turn dirty orange in color. Later, the color progressed upward and eventually affected the peduncles and pods. Upon opening the pod it was found that only the sclerenchyma layer in the interior of the pod was orange; removing the parchment layer restored the normal green pod color. In the stem, the orange color was confined to the phloem-xylem tissue. The remaining parts of the plant (leaflets, stipules, leaf-petiole) were green. Because the most distinguishing feature of the mutant is the orange pod, I have given it the name and symbol mentioned above, and both have been officially accepted. The type line for orp in the Wiatrowo collection is Wt 10263.

It is important to note that orp was induced in a line recessive for a (without anthocyanin). Moreoever, the mutant is the first known to involve the sclerenchyma of the pod.

Wt 10 263 (orp) was crossed with the Weibullsholm line WL 1 238 in an attempt to determine the mutants* linkage relations. The F1's were normal and the F2 showed monogenic recessive inheritance (Table 1A).

Table 1. Phenotypic distribution in F_2 populations segregating for Orp-orp from cross WT 10 263 x WL 1238.

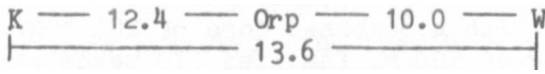
A. Orp-orp F_2 segregation

Orp	orp	Total	Chi-square (3:1)
352	105	457 Found	
342.8	114.2	457 Expected	0.998

B. Joint segregation of orp with k and with wb

Orp K	Orp k	orp K	orp k	Total	Joint Chi-square
259	105	77	0	441	28.38
Orp Wb	Orp wb	orp Wb	orp wb		
239	105	112	0	456	44.97

WL 1238 has a number of markers, among them being k and wb on chromosome 2. Table 1B shows the linkage analysis involving orp. k, and wb. The analysis was performed on the Wang computer at Weibullsholm, courtesy of Dr. Blixt. The estimated crossover values and the gene order are as follows:



A chemical analysis of orp expression would be a worthwhile and interesting undertaking. Moreover, I intend to combine orp with .p and v since the latter remove pod sclerenchyma.

1. Swiecicki. W. K. 1979. PNL 11:33-34.