$\underline{Fg_1}$, $\underline{Fg_2}$ and $\underline{Fg_3}$ loci: The inheritance of flavonol glycoside compounds was observed in one cross: PI 407,292 (G. soja, flavonol glycoside group 2T) x Hark (group 7t). F_1 plants were classified as group 1T; a small (n = 21) sample of F_2 progeny segregated 6-1T : 3-2T : 3-4T : 7-4t : 2-7t. Chi-square tests indicate that the segregation of $\underline{Fg_2}$ and $\underline{Fg_3}$ were not significantly different from 3:1; however, the segregation pattern of Fg_1 tested significantly different from the expected 3:1 ratio. This might simply be attributed to the small sample. However, Buttery and Buzzell (1976) have demonstrated that individuals containing both $\underline{Fg_1}$ and $\underline{Fg_3}$ (i.e., groups 1T, 1t, 3T and 3t) have significantly lower photosynthetic rates than individuals of other genotypes. The plants examined in this study were grown in the field and no attempt was made to insure the survival and adequate sampling of possible subvital individuals. This significant Chi-square may be the result of inadequate sampling measures. Additional crosses of G. max x G. soja have been made and inheritance of traits will be established.

References

Buttery, B. R. and R. I. Buzzell. 1976. Flavonol glycoside genes and photosynthesis in soybeans. Crop Sci. 16: 547-550.

Ting, C. L. 1946. Genetic studies on the wild and cultivated soybeans. J. Am. Soc. Agron. 38: 381-393.

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1) The monogenic and digenic control of hypocotyl and flower color in soybeans.

The pigmentation of seedling hypocotyl is important in the knowledge, at a very early stage, of success in the cross of plants differing in this aspect.

Several genes, among which are $\underline{W_1}$, $\underline{W_2}$, $\underline{W_3}$, $\underline{W_4}$, and wm, have been recognized as controlling flower pigmentation, and many studies indicate that flower and hypocotyl colors are closely associated. Hartwig and Hinson (1962) put in evidence that hypocotyl of $\underline{W_1}\underline{W_3}\underline{W_4}$ genotypes is darker than that of $\underline{W_1}\underline{w_3}\underline{W_4}$ ones. Bernard and Weiss (1973) reported that purple hypocotyl is controlled by the $\underline{W_1}$ gene having a pleiotropic effect.

Aim of this report is to present some data showing monogenic and digenic segregation ratios for hypocotyl and flower pigmentation and to forward indications of pleiotropic effects of two complementary genes controlling flower color.

Crosses were made between plants of American and Japanese varieties judged interesting for their yield components (Olivieri et al., 1979). F_1 plants were raised in summer 1978 and F_2 seed was sown on May 18, 1979 in plots distributed according to a randomized block design with three replications. Pigmentation was recorded assigning two classes of color.

Segregation ratios for hypocotyl and flower color are reported in Tables 1 and 2, respectively. Indications of monogenic control are evident for all cross combinations, with the exception of 'Mikawashima' x XK 505 whose segregation fit a 9:7 ratio. For this cross two complementary genes are involved in the control of hypocotyl and flower pigmentation and, if the same genes control both traits (as it is supposed by several studies), then both of them have a pleiotropic effect.

Table 1

Segregation for hypocotyl seedling color

Crosses	Observed number		Segregation 3:1		Segregation 9:7	
	Purple	Green	χ^2	P	χ^2	P
Mikawashima x Wells	101	30	0.308	0.75-0.50		
Mikawashima x SRF 150	198	66	0.000	0.99		
Mikawashima x XK 505	47	26	4.388	0.05-0.02	1.962	0.25-0.10
Mikawashima x Beeson	103	43	1.543	0.25-0.10		
Mikawashima x Caloria	107	26	2.108	0.25-0.10		
Mikawashima x Corsoy	87	36	1.548	0.25-0.10		
Traverse x Extra Early	78	29	0.252	0.75-0.50		

Table 2

Segregation for flower color

Crosses	Observed number		Segregation 3:1		Segregation 9:7	
	Purple	Green	χ^2	P	χ^2	P
Mikawashima x Wells	51	16	0.044	0.90-0.75		
Mikawashima x SRF 150	106	35	0.002	0.95-0.90		
Mikawashima x XK 505	20	15	5.952	0.02-0.01	0.011	0.95-0.90
Mikawashima x Beeson	57	17	0.162	0.75-0.50		
Mikawashima x Caloria	93	21	2.632	0.25-0.10		
Mikawashima x Corsoy	46	15	0.005	0.95-0.90		
Traverse x Extra Early	75	35	2.727	0.10-0.05		

References

Bernard, R. L. and M. G. Weiss. 1973. Qualitative genetics. Pp. 117-154 in B. E. Caldwell (Ed.), Soybeans: Improvement, Production and Uses. Madison, WI.

Buzzell, R. I., B. R. Buttery and R. L. Bernard. 1977. Inheritance and linkage of a magenta flower gene in soybeans. Can. J. Genet. Cytol. 19: 749-751.

Hartwig, E. E. and K. Hinson. 1962. Inheritance of flower color of soybeans. Crop Sci. 2: 152-153.

Olivieri, A. M., P. Parrini and M. Lucchin. 1979. Utilization of yield components in soybean breeding programs. (In Italian) Riv. Agron. (Italy) 13: 107-113.

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1) Changing the maturity of soybean cultivars using EMS.

This study was conducted to determine if the mutagenic agent, ethyl methane sulfonate (EMS), could be used to change the maturity of a soybean line while still maintaining the yielding ability and other morphological characters of the line. Mutants with changes in maturity have been reported