

OSMANIA UNIVERSITY
Hyderabad-7 (A.P.) India
Department of Genetics

1. Behaviour of half-opaque maize.

Eleven inbred lines have been selected for incorporation of the opaque-2 gene. After two backcrosses, the opaque kernels from the different lines were utilized in developing an opaque-2 synthetic. In the second generation of the synthetic opaque-2, several sectored kernels with normal (translucent) tissue were observed. These were classified into seven distinct types (S_2 to S_8). Diallele crosses were made among these including complete opaque (S_1). After two generations of selfing, certain crosses in the F_3 gave mainly half opaque kernels (S_5).

Table 1. Half opaque maize from certain diallele crosses

Cross	F_1	F_2	F_3
$S_2 \times S_4$	S_5	S_5, S_5^*	S_5
$S_4 \times S_3$	S_5	S_5^*	S_5
$S_4 \times S_7$	S_2	S_5, S_5^*	S_5
$S_4 \times S_7$	S_6	S_5^*	S_5
$S_4 \times S_7$	S_5	S_5, S_5^*	S_5
$S_4 \times S_8$	S_5	S_5, S_5^*	S_5
$S_5 \times S_6$	S_8	S_5, S_5^*	S_5
$S_6 \times S_4$	S_5	S_5	S_5

Note: $S_5^* = 1/3 / 3/4 \ o_2$

$S_5 = 1/2 \ o_2$

The lysine content of the sectored seed has been analyzed and it was found to be similar in all the types including half opaque suggesting that the sector size may not alter the lysine content. The modified opaque may be more useful in breeding high lysine maize and also may be more acceptable for direct consumption.

S. Annapurna
G. M. Reddy

2. Electrophoretic studies of half opaque endosperm (S_5).

One of the S_5 cobs from the cross $S_4 \times S_7$ was selected for biochemical studies. The normal half, $S_5(+)$, and opaque half, $S_5(o_2)$, were separated and the soluble proteins extracted with .01 M sodium pyrophosphate buffer containing 10^{-4} M EDTA and 0.7 ml of mercaptoethanol. The $S_5(+)$ and $S_5(o_2)$ tissues were also subjected to three consecutive extractions with water, 5% NaCl and 70% ethanol. All these protein extracts were subjected to electrophoretic separation in 7.5% polyacrylamide gels. The saline extract was dialysed before electrophoresis. Table 1 gives the pattern of protein bands in both translucent and opaque tissues of S_5 .

Table 1. Endosperm protein pattern of $S_5 +$ and $S_5 o_2$

Extract	Tissue	1	2	3	4	5	6	7	8
Na Pyrophosphate	$S_5 (+)$	I	I	M	M	A	I	M	F
	$S_5 (o_2)$	A	M	A	M	M	M	M	M
Water	$S_5 (+)$	F	A	I	M	F	F	F	
	$S_5 (o_2)$	M	M	M	F	F	F	A	
5% Na Cl	$S_5 (+)$	F	M	F	M				
	$S_5 (o_2)$	F	F	A	A				
70% Ethanol	$S_5 (+)$	F	F	F					
	$S_5 (o_2)$	A	A	A					

(I = Intense, M = Medium, F = Faint, A = Absent)