standard hybrid, the highest 124.6 percent, indicating a 32.5% difference. The same value in the case of normal standard is 28.4 percent. It is remarkable that the yielding ability of some heterozygous opaque hybrids reaches or approaches the normal standard. At the same time, Table 1 shows significant differences in specific combining ability of the hybrids of Syn A-3 o_2 sublines. In this respect, the hybrids of Syn A-3-36 o_2, Syn A-3-29 o_2 and Syn A-3-30 o_2 seem to be promising. These properties are supplemented by the expected increase in lysine content by nearly 25 percent.

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1. Hollow endosperm in maize.

Hollow endosperm, an allele of sh_1, was isolated from a single kernel on the cob where ACRShWx (coloured, non shrunken and non-waxy) plants from EMS-treated seeds were crossed with csh_1wx pollen.

The kernel was colorless, non-shrunken and had a hollow cavity in the center. The phenotypic expression of the changed kernel indicated a possible loss of an intrachromosomal segment including the C and Sh_1 loci (2.8 map units apart). The mutant on selfing gave fifty hollow, seventy intermediate and 132 shrunken type seeds. The waxy and non-waxy were equal in number. When further selfed (Table 1) and reciprocally crossed to the pollen parent (Table 2), plants from hollow seeds showed only 20 to 30% hollow kernels. The hollow mutant, as well as the linked marker Wx, failed to be transmitted through the pollen. The Wx gene showed equal segregation in the hollow cob with slightly significant deviation. This suggests that there was a loss of a small chromosomal segment including C and a portion distal to it, which prevented functioning of gametes through the pollen. The hollowness indicated a possible mutational event at the Sh_1 locus. Prolonged selfing of plants from

Table 2

Reciprocal cross of hollow, non-waxy and c sh_1 wx plants

S. No.	Cross	Kernel type				♀ csh_1 wx x hollow Kernel type	
		non-waxy			waxy	non-waxy	waxy
		Hollow	Inter-mediate	Shrunken	Shrunken	Shrunken	Shrunken
1	♀ Hollow + nonwaxy x csh wx	52	16	20	108	32	268
2	"	64	28	21	112	36	284
3	"	48	20	12	94	48	256
4	"	36	31	30	98	44	296
5	"	42	19	10	123	62	416
6	"	69	32	40	115	41	291
7	"	61	20	19	136	31	241
8	"	49	41	29	126	26	216
9	"	65	32	24	136	24	262
10	"	41	29	32	148	18	196
11	"	55	34	46	98	36	284
12	"	23	26	32	114	39	301
13	"	41	39	23	88	28	205
14	"	49	28	46	139	54	324
Total		695	395	384	1635	531	3741
Percent expression		22.35	12.70	12.35	52.60	12.42	87.58

Table 1

Kernel types produced by selfed individuals of the hollow kernel progeny

S.No.	Kernel type selfed	Kernel type			
		Non-waxy			waxy
		Hollow	Inter-mediate	Shrunken	Shrunken
1	Hollow, non-waxy	50	35	40	125
2	"	42	26	20	105
3	"	62	27	21	131
4	"	41	21	20	68
5	"	34	22	24	94
6	"	50	32	38	110
7	"	56	24	23	105
8	"	36	24	30	112
9	"	74	10	21	98
10	"	44	16	28	108
11	Intermediate types	34	32	22	99
12	"	84	26	20	124
13	"	24	20	26	92
14	" (6 cobs)	-	-	1184	1164
15	Shrunken (10 cobs)	-	-	1546	1464

hollow kernels resulted in a few cobs with a higher percent of hollowness. The test for the Sh_1 protein was negative, resembling the results found with the recessive $\underline{sh_1}$ (P.S. Chourey).

Chandramouli

2. Jointed seed syndrome in maize.

Jointed seeds, which spontaneously occur as a freak in maize, were not commonly inherited. A high frequency of jointed seeds, 2.5 per cent, was observed on a cob obtained from ethyl methanesulfonate treated seeds. On further analysis, by selfing the plants, it was found that 45 plants had jointed seeds ranging from 0.3 to 5.4 per cent and in 21 plants it was completely absent (Table 3). It seems that the character was inherited in

Table 3

Frequency of jointed seeds from selfed plants

S.No.	Number of plants	Seed type		Range-percent jointed
		Normal	Jointed	
1	2	685	42	above 5
2	3	362	17	4 - 5
3	16	4012	160	3 - 4
4	9	1800	41	8 - 3
5	10	2365	35	1 - 2
6	5	1689	10	below 1
7	21	6257	Nil	Nil

simple Mendelian manner plant-wise and its expression was quite limited. The induced change suggests a possible dominant expression and a maternally inherited one. The orientation of the two embryos in the jointed seeds was either opposite, alternate or adjacent and sometimes one of the embryos was in between the seeds. It is inferred from the cross that the seeds of jointed types arose from two independent pollen grains. The nature of the formation of these kernels is not yet clear and it is assumed that they are produced from the sterile flower of the spikelets, which becomes fertile and fuses to the normal seed.

Chandramouli

3. Induced dominant mutant Ce (curled-entangled).

Previously (MNL 47:17) it was reported that the pattern of segregation of the induced dominant mutant, curled-entangled, was abnormally deviating from a simple Mendelian ratio in selfed progenies. When selfed progenies were grown under controlled conditions in a sand flat (Table 4), the segregation was clearly three dominant and one normal type. The significant deviation was due to the homozygous and some heterozygous mutant plants which were severely entangled during the germination period and were incapable of emerging in field soil as against sand.

Table 4

Segregation of mutant plants in progenies derived from crosses of Ce/N heterozygotes

Pedigree No.	Genotype	No. seed grown	Plant type			
			Normal	Mutant		
				Possible homozygous		Hetero-zygous
				Severely en-tangled	Not severely entan-gled	
Co 72-41	[Ce x N] ⊗	148	36	31	1	80
-42	"	70	16	3	7	44
-44	"	125	30	20	20	50
-47	"	129	27	16	6	68
-48	"	79	18	11	5	38
-49	"	164	43	18	11	88
-59	"	176	44	28	6	96
-51/46	Sib	139	40	28	0	70
-51/43	"	154	34	26	8	86
-58/52	"	101	22	28	0	70

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