

Temperature and relative humidity	Storage periods (in hours)	Chromosome and markers	Kernels scored	% of germless kernels	% of endosperm mutations
3°±1°C 70-90%	1	3,5 a ₁ sh ₂ ,pr	988	9.6	14.6
	4		1130	16.6	19.6
	60		980	9.1	17.6
	121		498	13.2	13.6
20-30°C 60-70%	1	idem	663	11.7	10.2
	4		587	19.2	19.0
	22		153	17.9	22.2
	30		136	22.0	18.2
3°±1°C 70-90%	1	idem*	716	15.5	13.7
	48		193	18.6	19.8
	78		340	19.1	11.9
	96 1/2		68	19.1	14.0
3°±1°C 70-90%	148	9 C sh bz wx	217	23.9	16.4
	1 1/2		493	4.2	2.6
	52		558	6.6	4.3
	148		212	6.6	3.3

The data marked with an asterisk refer to a hybrid type, homozygous nevertheless for the appropriate markers involved: the radio-sensitivity of the hybrid appears somewhat greater as compared with that obtained from an inbred line.

The recovery following the initial increase of damage could partially be ascribed, either to the active metabolism of pollen and/or to aplontic selection. The types of mutations detected are of the kind common in maize, and interpretable as chromosomal deletions.

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3. Mutagenic activity of nebularine and ethyl methane sulphonate.

Mutagenic activity of such chemicals has been studied on the basis of endosperm mutations, following treatment of mature pollen. Solutions are administered with a vial applied to tassels newly shedding pollen 24 hours before a first pollination, which was, then, repeated for 2 more successive days.

Chemical	Concentration	Chromosome 9 markers		Chromosome 3 markers	
		No. of kernels scored	% of mutations	No. of kernels scored	% of mutations
Nebularine	control	838	0.1	518	0.4
	.25%	1873	0.5	343	2.6
	.5%	712	2.0	480	4.3
	1.0%	460	2.4	522	1.8
	2.0%	293	1.4	203	13.3
Ethyl methane sulphonate	control	167	0.6		
	0.25%	437	0.2		
	.5%	224	0.9		
	1.0%	117	3.4		
	2.0%	154	2.6		

Additional treatments, under the same experimental conditions, have been made with diethylsulphonate and curcume extracts with negative results.

The types of mutations detected in nebularine experiments are hardly to be interpreted as point mutations, at variance with data reported in other organisms, including barley. The activity of ethyl methane sulphonate appears not very strong especially if one considers its powerful action when applied to seeds.

Some data have been obtained also on the basis of seedling characters, making use of markers of the corresponding chromosome regions (Y_2 , for chromosome 9, and a_1 for chromosome 3). The mutation rate in such cases is greatly reduced, more or less, as already found with other chemicals (as diepoxibutane). Namely the chemicals used behave as good inducers of partial endosperm mutations (affecting only a part of the endosperm) but have a reduced or null effect on the sporophyte generation.

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