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## Mutagenicity Testing of some Widely Used Pesticides S. S. Choudhary & S.M. Sajid

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Three concentrations of each of sevin, malathion and bavistin were tested on Zea Mays cv. Ganga Safed 5. Pollen grains of treated and controlled plants were stained in Lugol's solution and colour of the pollen grains was recorded. Pollen grains with gene "wy" for waxy endosperm turned red while those with normal gene "WY" for starchy endosperm indicated blue colour in Lugol's solution.

Fishbein *et al* (1970) mentioned a number of genetic tests for mutagenic action of pesticides. One of them is the maize test system. When mutation is induced in normal starchy allele "WY" of maize, it turns into waxy allele "wy". Realizing the importance of such investigation, we have chosen to study the mutagenicity of sevin, malathion and bavistin using the maize test system. The seeds were washed and sown in seperate plots. Control seeds were soked in distilled water. The tassel, when emerged, were collected from 10 plants of each plot for analysis of pollen grains. They were dusted in a few drops of Lugol's solution (Gatenby & Beams, 1950) on a glass slide and the stained pollen grains were counted.

**OBSERVATIONS** There are a few genses which influence the gametes in which they are formed (Winchester, 1974). Pollen grains of maize with gene "wy" for waxy turn red in presence of Lugol's solution and pollen grains with normal genes. "WY" for starchyendosperm turns blue with Lugol's solution. The mutagenicity test for sevin and malathion on

### MATERIALS & METHODS Aqueous

solutions of sevin at 0.125%, 0.25% and 0.5%, bavistin at 0.1%, 0.2% and 0.4% and malathion at 0.05%, 0.1% and 0.2% were used. Zea mays L.cv. Ganga Safed 5 was used; the seeds were soaked in distilled water for 24 h and transferred to the pesticides for 4h.

# Table - 1 The frequency (%) of waxy alleles in the pollen of Zea mays L.untreated and treated with Sevin, Bavistin and Malathion.

Parameter	Sevin				Bavistin				Malathion			
	Control	0.125%	0.25%	0.5%	Control	0.1%	0.2%	0.4%	Control	0.00%	0.1%	0.2
No.of Pollens analysed	5217	3474	4671	4538	5217	4708	4990	5165	5217	3090	3300	4050
Pollens with waxy alleles												
No.	34	102	192	304	34	700	495	510	34	266	349	640
%	0.65	2.94	4.11	6.70	0.65	14.87	9.92	9.87	0.65	8.61	10.58	15.80
	+0.16	+0.50	+0.50	+0.60	+0/16	+0.60	+0.50	+0.50	+0.16	+0.40	+0.50	+0.30
't' difference with												



#### MUTAGENICITY AND PESTICIDES

maize showed that these increasseds the frequency of Waxy' pollen grains (Table-1). The mutagenicity test for bavistin indicated that lower concentration caused higher percentage of waxy alleles (Table-1). The increases in the percentage of waxy pollen grains were highly significant.

**DISCUSSION** The pesticides increased the frequency of waxy alleles in the pollens of maize. The spontaneous rate for this allele is 6 in 1,00,000 (Briggs *et al*, 1965; Amano, 1967). Induction of high rate of waxy mutation may partly be due to clustering of mutations (Muller, 1952).

High percentage of waxy allele in the pollen grains of treated plants is due to induction of mutation by agrochemicals. However, presence of waxy allele with the control variant may be due to segregation.

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