TABLE I

Ascorbic acid contents (in mg/100 g in the pulp) of healthy and infected fruits of pineapple

	Days of incubation				
	0	2	4	6	8
Ascorbic acid in infected	50·5	50·0	39·5	27·5	19·1
Ascorbic acid in healthy (control)	50·5	51·3	50·8	48·1	47·2

pronounced in the infected ones. Losses in control fruits were comparatively small. Rapid decline in ascorbic acid in mango, papaya, guava and 'aonla' fruits by fungi was reported[2,3,6]. Such decline in vitamin C may be due to the increased oxidation in the infected fruits because the enzymes, oxidases including ascorbic acid oxidase was known to occur during fungal infection[1]. Ascorbic acid oxidase was also detected in certain fungi[5,7].

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AFLATOXIN PRODUCTION AND LOSS IN CALORIC VALUE OF MAIZE SEEDS DUE TO *ASPERGILLUS PARASITICUS*

MAIZE is a potent source of energy with high caloric values. This is also one of the best substrates for the growth of *Aspergillus flavus* and *A. parasiticus* as well as for aflatoxin production. Consumption of aflatoxin contaminated food causes a wide range of diseases in animals[1] and human beings[2]. In this communication aflatoxin production and loss in caloric value of maize seeds due to a known aflatoxin producing strain of *A. parasiticus* (NRRL-3240) is reported.

Two sets of experiments were conducted with Ganga-2 variety of maize. In one lot, 25 g surface sterilized seeds were used and in the second lot, 25 g of soaked seeds were autoclaved at 15 lb psi for 10 minutes in a 250 ml Erlenmeyer flask. Both the seed lots were inoculated with 0·5 ml spore suspension of *A. parasiticus* and the flasks were incubated at 28 ± 1° C for different periods. After each incubation period, the infested seeds were extracted with chloroform. Qualitative estimation of aflatoxin was done on TLC plates in toluene ; iso-amyl alcohol : methanol (90 : 32 : 2, v/v) solvent system[3] and quantity of aflatoxin B_1 was estimated by the method of Nabney and Nesbitt[4].

For the determination of caloric value, thoroughly washed and dried seeds were ground and the flour was pressed to form pellets. Caloric values of the samples were estimated by the method of Lieth[5] by using an isothermal bomb calorimeter.

Aflatoxin formation started after 2 days in autoclaved maize seeds, while in surface sterilized seeds, it was initiated on the 4th day (Table I). The maximum production of aflatoxin was achieved on the 16th day in autoclaved seeds and on 20th day in surface sterilized seeds. The quantity of aflatoxin continued to rise with the increase of incubation periods, till it reached the maximum. Subsequently, during the later phase of incubation period (30 days) there was a decline in the aflatoxin concentration.

TABLE I

Production of aflatoxin B_1 in maize seeds at different incubation periods by Aspergillus parasiticus

Incubation period (in days)	Amount of aflatoxin B_1 (mg/100 gm)	
	Surface sterilized seeds	Autoclaved seeds
0	—	—
2	—	+ (trace)
4	+ (trace)	5·36
6	3·64	8·44
8	5·36	11·80
10	7·28	14·16
12	9·44	16·52
14	12·78	18·88
16	14·16	20·06
20	15·80	20·06
30	14·16	18·88

The production of aflatoxin on various agricultural commodities is controlled by a variety of factors[6]. The optimum duration of the incubation period varies with the temperature, moisture, fungal strain and the substrate. Diener and Davis[7] reported considerable decline in the amount of aflatoxin present in stored peanuts during prolonged incubations.

Loss of caloric value in maize seeds due to infestation with *A. parasiticus* was well marked (Table II). Maize grains have a high caloric value (5·286 K Cal/gm dry weight), which sharply declined in the later phases of incubation. The per cent loss in caloric value was 6·82 and 9·47 after 8 and 16 days respectively in the surface sterilized seeds while in the autoclaved seeds, the loss was 6·55 and 13·25% respectively.

TABLE II

Loss in caloric value of maize seeds due to A. parasiticus *infestation*

Incubation period (in days)	Surface sterilized seeds		Autoclaved seeds	
	Caloric value K Cal/gm dry weight	% loss	Caloric value K Cal/gm dry weight	% loss
0 (Control)	5·286	0	5·190	0
8	4·923	6·82	4·840	6·55
16	4·784	9·47	4·501	13·25

It is evident from the present studies that the toxigenic strains of *A. parasiticus* not only produce aflatoxins, a potent carcinogen but they also reduce the nutritional quality of seeds due to loss in caloric value.

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EARLY MATURING BOLD SEEDED MUTANTS IN PIGEON PEA [*CAJANUS CAJAN* (L.) MILL SP.]

TYPE-21 (T-21) is a popular cultivar of pigeon pea grown widely in the irrigated areas of northern and central parts of India. This variety belongs to the early maturing group and has good cooking quality and taste[1]. One of the drawbacks of T-21, however, is the small seed size. In general, consumers prefer 'dal' with large cotyledons and such types are available only in long duration cultivars. Bold seed types with the yield potential equal to that of T-21 are not available in the early (less than 150 days) maturing group. Therefore, a mutation breeding programme was initiated in 1972 with the specific objective to improve the seed size of T-21. This resulted in the isolation of seven bold seeded mutants. The present communication deals with the preliminary report on the performance of two of these radiation induced mutants.

Details of radiation exposure and observations on the M_1 and M_2 generations have been reported elsewhere[2]. Seven mutants with visibly bolder seeds than the parent were isolated in the M_2 generation of thermal and fast neutron treatments. Their breeding behaviour was studied up to the M_5 generation. Two of the mutants, TT (Trombay Tur)-4 and TT-6 were included in the yield trials of the All India Co-ordinated Pulse Improvement Project. As Trombay conditions are not suitable to conduct yield evaluation studies, the seeds were given for yield trials to various institutions and the yield data obtained are incorporated here. Plant height and yield components like number of branches, number of pods per plant and number of seeds per pod from one of the locations are given in Table I. The data on yield and 100 seed weight were obtained from different locations (Table II).

Table I shows that though the plant height and the number of branches were higher in both the mutants, the number of pods per plant was not significantly different from the parent. TT-4 was semi-spreading like the parent, while TT-6 had a compact habit. At most of the locations, TT-4 and TT-6 gave numerically, (though not statistically) superior yields (Table II). In two experiments at Rahuri and Delhi the mutants