5–7 pyrenoids arranged regularly near the periphery. Asexual reproduction by means of thick-walled aplanospores; aplanospores spherical, smooth-walled, 23–24 μm in diameter; wall consisting of two distinct layers, outer wall not so dense as compared to the inner one. Habitat: Road-side ditches, Ratanpur; July, 1983 (C. No. V-32).

It differs from its nearest related species, *E. elegans* by having 5–7 pyrenoids regularly arranged near peripheral region of cell. Pyrenoids are sometimes more and the distribution is random as in *E. elegans*[2]. Aplanospore formation is reported only in *E. elegans*[1,2]. Aplanospores in the present species differ from those of *E. elegans* in having smooth walls while verucated or rough walls have been shown for those of *E. elegans*[1,2].

E. plusicocca G. M. Smith is a new record and aplanospore formation is reported for the first time in the species in India.

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INDUCED STERILE MUTANTS IN SOYBEANS

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SOYBEAN (*Glycine max* (L) Merrill) is a highly self-pollinated crop and the success in artificial crossing is extremely low. Moreover, the small size of flowers makes emasculation very difficult. Therefore, it is practically not possible to obtain a large number of hybrid seeds from the routine breeding program. This has restricted the soybean breeders to use only a limited number of breeding methods. Brim and Stuber[2] have suggested the utilization of male sterile stocks for soybean improvement program. This paper reports the frequency and inheritance of sterile mutants induced in cultivars, Bragg and Type-49 using gamma rays and EMS.

For each treatment 200 seeds of Bragg and Type-49 were used. They were treated with (i) 10, 15, 20, 25 and 30 krad of gamma rays, (ii) 0.1, 0.2, 0.3, 0.4, 0.5 and 0.6% ethylmethanesulphonate (EMS) for 12 hr and (iii) three double treatments of gamma rays and EMS, *viz* 10 krad gamma rays + 0.2% EMS, 10 krad gamma rays + 0.4% EMS and 15 krad gamma rays + 0.2% EMS. Treated seeds alongwith respective untreated controls were planted in single row plot in split plot design using three replications. At maturity, seeds of individual M_1 plants were harvested and kept separately for each treatment and variety. The individual M_2 progeny rows were planted and screened for male sterile mutants by observing pollen fertility using acetocarmine. In order to verify the genetic behaviour of male sterile mutants observed in the M_2 generation, individual plants of segregating progenies were harvested separately. The segregating M_3 progenies were scored for mutant and parent phenotypes. Pollen grain study of sterile plants was done in the M_3 progenies for confirming the male sterility.

Most of sterile mutants produced defective pollen grains which were less in number, variable in size and predominantly unstained with acetocarmine. Very few pods set on most of the male sterile plants, indicating female fertility. The total frequency of male sterile mutants in Bragg and Type-49 was approximately same (table 1). However, there were considerable differences among the different doses of gamma rays, EMS and their select combination with respect to the percentage of progenies segragating for male sterility. In Bragg, 15 krad gamma ray treatment produced the maximum number of male sterile mutants while in Type-49, 0.4 and 0.5% EMS treatments showed the maximum mutants (table 1). Interestingly, in Bragg, 0.4% EMS gave minimum mutations (5.00%) while in Type-49 the 0.2% EMS in combination with 10 krad or 15 krad of gamma rays exhibited lowest mutation frequency (6.66%), indicating differential response of both the genotypes to the different doses of gamma rays and EMS. The effects of gamma rays and EMS treatments were not found to be synergistic with respect to mutation frequency in the present study.

Table 1. *Percentage of lines segregating for sterility in M_2 generation of Bragg and Type-49 soybeans.*

Treatment	Bragg		Type-49	
	Total lines	Frequency (%)	Total lines	Frequency (%)
10 krad gamma rays	110	5.45	103	6.80
15 krad gamma rays	83	28.92	91	16.50
20 krad gamma rays	91	14.29	103	19.40
25 krad gamma rays	50	22.00	68	17.64
30 krad gamma rays	17	17.60	47	17.02
0.1% EMS	25	20.00	28	7.14
0.2% EMS	18	16.00	51	9.80
0.3% EMS	25	8 00	26	23.08
0.4% EMS	20	5.00	28	25.00
0.5% EMS	10	10.00	20	25.00
0.6% EMS	16	6.66	8	12.50
10 krad + 0.2% EMS	9	11.11	30	6.66
10 krad + 0.4% EMS	10	10.00	37	16.22
15 krad + 0.2% EMS	15	6.66	30	6.66
Total	499	14.63	670	14.93

The segregation pattern of M_2 and M_3 generations indicated that male sterility is a monogenic recessive trait. The χ^2-values, pooled (3.36 at ldf) as well as heterogeniety (6.38 at 19 df) fitted closely to a 3 parent: 1 mutant phenotype ratio. Earlier investigators[3,4,9] have reported on the completely sterile plants in soybean. Brim and Young[1] reported the male sterile character and its inheritance as monogenic recessive (ms_1ms_1). Singh *et al*[6] were the first to obtain the two male sterile and female fertile mutants in Semmes cultivar of soybean through gamma ray irradiation. Latter on, other investigators[7,8] also obtained the male sterile mutants. The mutant character in all these studies[5,7,8] have been shown to be inherited as monogenic recessive, as in this case. In the present study, Bragg and Type-49 did not differ much in the frequency of sterile mutants, however in earlier studies[7,8] Bragg was found to be more responsive than Type-49. The possible reason for this disparity may be that in the previous studies only three doses (10, 15 and 20 kr) of gamma rays were used while in the present study fourteen treatments were employed. Consequently, the recovery was maximum from both the genotypes. The differences in doses may also be partially accounted for the variable number of M_1 plants and M_2 progenies evaluated. As a result of lower survival in M_1 generation, the number of M_2 progenies in some of higher doses of gamma rays and EMS was low and therefore, the mutation frequency was sometime quite high.

A large number of sterile plants that were observed from the gamma ray irradiated and EMS treated populations in the present study are of considerable value from the breeding point of view. The sterile mutants observed in the present study can be classified into two categories on the basis of pod and seed setting under field conditions. They include (i) plants that were completely male and female sterile which are of no practical value in plant breeding and (ii) plants having varying degree of female fertility, which may be utilized in soybean improvement program.

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GUIGNARDIA FRUIT ROT OF GUAVA—A NEW DISEASE FROM BANGALORE

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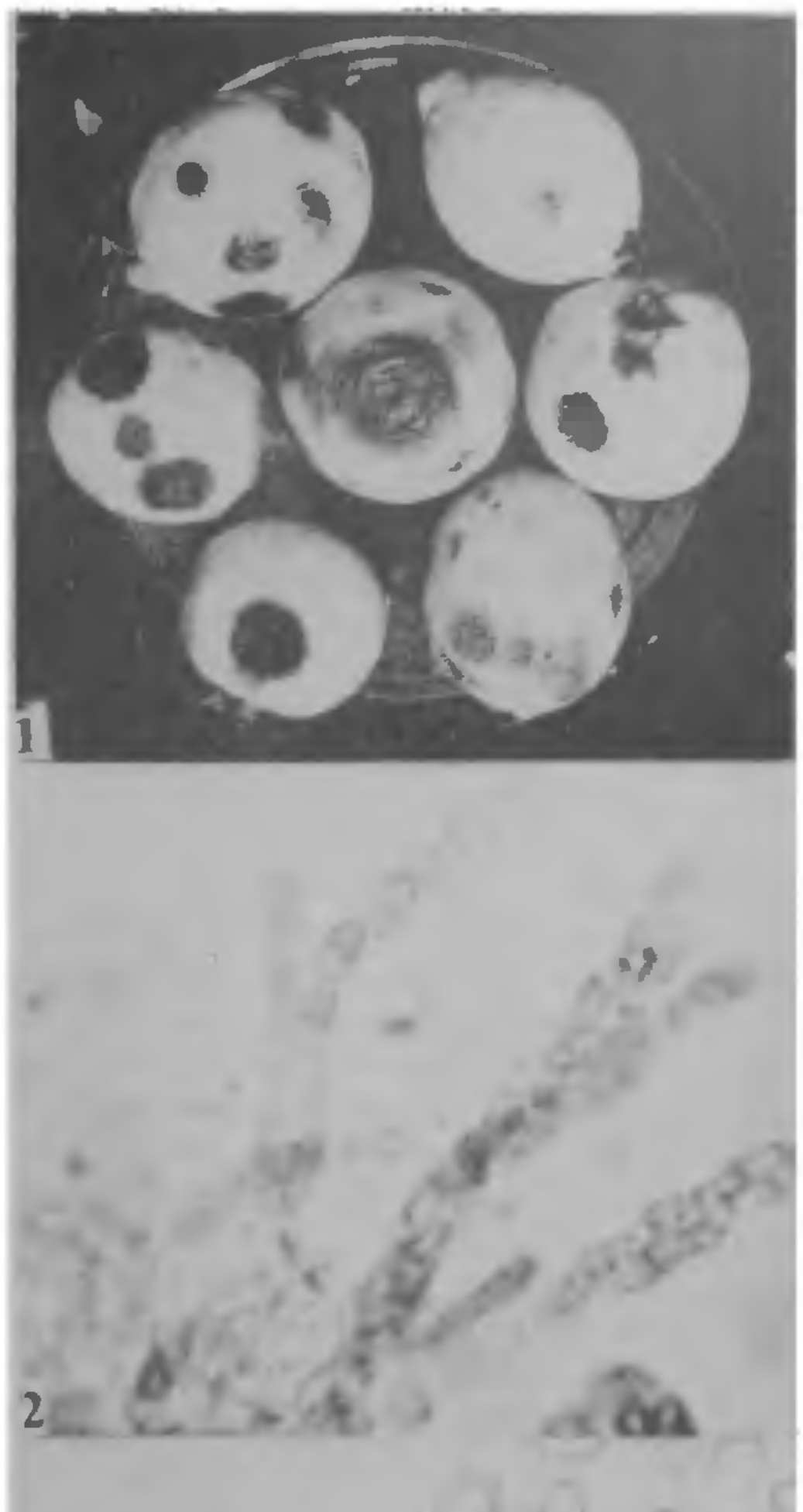
DURING August–September, 1980 a new fruit rot of guava was observed on the variety Beaumont in transit as well as in the field. The variety is especially suited for jelly preparations because of its high lycopine pigment, pectin content and acidity.

Symptoms:

In the initial stage the infection develops as minute depressed or flattened spots on the ripening fruits. In these spots the fungus generally develops in a concentric manner. Because of the dark-coloured mycelium, the symptom appears very marked on ripening golden yellow fruits (figure 1). One to several spots may occur, may coalesce and form bigger lesions. No fungal fruiting structures have been observed to develop on infected fruits. The fungus was isolated on potato Dextrose Agar on which it produced both ascigerous as well as pycnidial stage after 10 days of incubation under laboratory conditions. Pathogenicity was established by inoculating healthy fruits under laboratory conditions. Typical symptoms appeared 6–8 days after inoculation. Since there is no species of *Guignardia* which has been reported to cause infection of guava it is being described as new to science as *Guignardia psodii* sp. nov. (figures 2 & 3).

Colonies on potato Dextrose Agar greenish grey, becoming bluish black with abundant aerial mycelium, reverse dark grey to black, submerged mycelium consists of green to brownish black hyphae. Ascocarps numerous, carbonaceous, intermixed with pycnidia, dark brown, single or aggregated in groups forming stromata. Individual stroma globose to broadly cylindrical with short to long necks beset with



Figures 1–3. 1. *Guignardia psidii* sp. nov. infection on guava fruits. **2.** and **3.** Asci and pycnidiospores of *Guignardia psidii* respectively × 600.