NOTE ON INHERITANCE OF SEED COLOUR AND PURPLE EYE ON STANDARD PETAL IN HORSEGRAM (*DOLICHOS BIFLORUS* L.)

GENETIC studies in horsegram have been very few. Rangaswami Ayyengar *et al.*[1] and Sen and Bhowal[2] found that purple pigment in different parts of the plant and the black colour of the seed are controlled by one gene which is dominant over its allele responsible for the absence of such pigmentation in different parts and brown seeds. The present study deals with the inheritance of purple eye in the middle of standard petal and seed colour. The mode of inheritance of these two characters is reported here for the first time.

TABLE I

Segregation of Characters in F_2

Cross	Characters	Observed segregation				Ratio	X^2	P
		Dominant		Recessive				
EC 7460 × Makari shore	Seed colour	99		31		3:1	0·09	0·70–0·80
	Purple eye on standard petal	96		34		3:1	0·09	0·70–0·80
		Joint segregation of the two characters						
		AB*	Ab	aB	ab			
		72	27	24	7	9:3:3:1	0·46	0·90–0·95
		Dominant		Recessive				
EC 7460 × CO·1	Seed colour	157		55		3:1	0·11	0·70–0·80
	Purple eye on standard petal	155		57		3:1	0·40	0·50–0·70
		Joint segregation of the two characters						
		AB	Ab	aB	ab			
		115	42	40	15	9:3:3:1	0·52	0·90–0·95
		Dominant		Recessive				
Pooled F_2	Seed colour	256		86		3:1	0·004	0·95
	Purple eye on standard petal	251		91		3:1	0·47	0·30–0·50
		Joint segregation of seed colour with purple eye						
		AB	Ab	aB	ab			
		187	69	64	22	9:3:3:1	0·54	0·90–0·95

*AB = Black mottled seed, purple eye present; Ab = Black mottled seed, purple eye absent; aB = Brown seed, purple eye present; ab, Brown seed purple eye absent.

The culture EC. 7460, which has black-mottled seeds and no purple eye on the standard petal, was crossed with two brown seeded cultures *viz.*, 'Machari-shore' and Co. 1; both having a prominent purple eye on the standard petal. The F_1 plants raised in 1974–75, showed black-mottled seed and prominent purple eye, suggesting that black-mottled colour of the seed and presence of purple eye are dominant over brown seed and absence of purple eye on stnadard petal. The F_2 generation was grown in 1975–76 and the segregation data clearly indicated that the black-mottled colour is governed by a single dominant gene B^m, and that the presence or absence of purple eye is also monogenically controlled and the gene symbol is designated as *Pe* (Table I). The joint segregation of these two characters showed that they are independently inherited (Table I).

It is suggested that the purple eye on the standard petal can be used as a marker gene.

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PROTECTIVE ACTION OF SOME FUNGICIDES AGAINST APPLE ROT CAUSED BY *PENICILLIUM EXPANSUM* (LINK) THROM.

APPLE ROT is a storage disease. This disease deteriorates the keeping quality of apples within a very short period after the harvest. Usually apples could not be stored more than a month under ordinary storage conditions due to apple rot disease. It is believed that this disease may be caused due to a number of pathogens, of which *Penicillium expansum* (Link) Throm. seems to be most important[1,2,4,5]. In a preliminary survey made at this laboratory, it has been possible to identify the presence of *P. expansum* in most of the rotted apples collected from the local markets. Considering the significance of *P. expansum* in reducing the storage life of apple, work has been undertaken to find out the protective effect of some fungicides against this pathogen.

P. expansum was isolated from the rotted apples collected from the local market. The identification of the pathogen was confirmed by comparing the vegetative and reproductive characters of the isolates with the characters described by Gilman[3]. The isolates after identification, were maintained on potato-dextrose-agar slants at 26° C.

Fresh scab free apples (Red Delicious) were collected from the market and divided into two batches. One batch of fruits was pretreated with the fungicides before inoculation with the pathogen and the fruits of the other batch were first inoculated with the pathogen and then treated with the fungicides. Three fungicides namely Bavistin [2-(Methoxycarbomoyl)-benzimidazole], Allisan [2-6 dichlor-4-nitro aniline] and Difolatan cis-N-(1, 1, 2, 2-tetrachloroethylthio)-4-cyclohexane-1, 2-dicarbaximida] at three different concentrations namely 0·1%, 0·2% and 0·3% were tested. The fruits were dipped in the respective fungicidal solutions for 3 minutes. To inoculate the fruits with the pathogen, a wound of approximately 12 mm in diameter was made with a sterile knife. Inoculum was obtained from a fresh culture of the isolate and aseptically introduced into the wound. The wounded portion was then covered back with the partially removed skin of the fruit. The inoculated fruits were then incubated at 26° C and the rotting percentages of the samples were determined upto 15 days.

When the samples were observed after 7 days of incubation, the average rotting per cent of the control fruits was found to be 12·1. In the case of both the pre-inoculation and post-inoculation, the average rotting percentages with different treatments were found to be significantly lower than those with the control. When Bavistin was applied at 0·1%, 0·2% and 0·3% as pre-inoculation treatment the respective average rotting per cents were 2·1, 5·0 and 2·8 but the variations found due to different concentrations were not statistically significant. The rotting percentages with different concentrations of Allisan and Difolatan were slightly higher than that found with the different concentrations of Bavistin. The rotting per cent with 0·1, 0·2 and 0·3% Allisan were 7·1, 6·5 and 7·0 respectively, the differences observed, however, were statistically insignificant. The rotting per cents with 0·1, 0·2 and 0·3% Difolatan, were 6·0, 6·5 and 6·5; the differences observed in these cases also were not statistically significant.

In the case of the post-inoculation treatments, the rotting per cents with 0·1, 0·2 and 0·3% Bavistin were 7·0, 5·0 and 6·6. The variations observed with respect to the different coucentrations of the fungicides, were not satistically significant. The rotting per cents with 0·1, 0·2 and 0·3% Allisan were 8·1, 7·8 and 7·8 and that with 0·1, 0·2 and 0·3% Difolatan were 6·3, 7·1 and 7·6. The variaions were also statistically insignificant.

When the samples were observed after 15 days of incubation, 100% rotting was found in the control. The rotting percentages in the treated samples' however, were significantly lower in the treated case and did not exceed 28·3%. In the case of the pre-inoculation treatments with 0·1, 0·2 and 0·3% Bavistin, the average rotting per cents were 6·6, 7·0 and 3·0; the variations observed were not, however, statistically significant. In the case of the treatments with 0·1, 0·2 and 0·3% Allisan, the respective average percentages of rotting were 25, 20 and 28·3 and that with 0·1, 0·2 and 0·3% Difolatan were 20, 12 and 16·6 respectively. The variations observed with the different concentrations of both the fungicides were statistically insignificant.

In the case of the post-inoculation treatments, the average rotting per cents with 0·1, 0·2 and 0·3% Bavistin, were 22·6, 11·6 and 11·6; the rotting per cent with 0·1% Bavistin was significantly higher than that with 0·2 and 0·3% Bavistin. The average rotting per cents with 0·1, 0·2 and 0·3% Allisan were 28·3, 26·6 and 28·3 respectively, the variations observed in these treatments, however, were not statistically significant. The average rotting per cents with 0·1, 0·2 and 0·3% Difolatan were 26·6, 26·6 and 16·6 respectively. The average rotting per cen with 0·3% Difolatan, was significantly lower than that observed with 0·1 and 0·2% of that fungicides.

When the rotting per cents of the fruits of pre-inoculation treatments were compared with those of the fruit of post-inoculation treatments, less rotting was found with Bavistin. From this experiment, it is apparent that dipping fruits in Bavistin at even 0·1% concentration, may protect the fruits from the rot caused by *P. expansum* to a large extent.

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