

## Screening of Bell Pepper and Paprika Germplasm for Resistance to Fusarium Wilt *Fusarium pallidoroseum* (Cooke) Sacc

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### Abstract

A total of 48 lines of bell pepper and 46 lines of paprika were screened during *kharif* of 2004. Six week old seedlings after uprooting from nursery were dipped in spore suspension of *Fusarium pallidoroseum* (Cooke) Sacc. For 30 minutes and then planted with three replications at a spacing of 60 cm × 45 cm in *Fusarium* sick field where wilt incidence was almost cent percent in the previous and current seasons in highly susceptible line California Wonder. Among the lines/cultivars screened, no genotype either in bell pepper or in paprika were found immune to the disease. However, four lines namely SP-21, SP-616, SP-617 and SP-706 in bell pepper were found to be highly resistant with wilt incidence ranging from 1 to 10%. Under resistant category there were four lines in bell pepper SP-3, SP-52, SP-613 and SP-606 and 11 lines in paprika P-1-1, P-2-1, P-7, P-12, P-54-3, P-101, P-104, P-141, P-301, P-305 and P-311 with PWI ranging from 11-30%.

**Key words :** *Fusarium* wilt, Bell pepper, Paprika, Resistance.

The *Capsicum* genus which represent a diverse plant group, from well known sweet green bell pepper to the fiery hot pepper is important both as spice and vegetable and now gaining importance for extraction of oleoresin which is used extensively in food and pharmaceutical industries. In Kashmir though edaphic and environmental conditions are favorable for cultivation of both bell pepper and paprika, the plant growth and fruit yield are severely effected due to occurrence of *Fusarium* wilt caused by *Fusarium pallidoroseum* (Cooke) Sacc. It has become an important major disease during the past years occurring in epiphytotic form with severity ranging from 30 to 100%. Various attempts to manage disease through fungicide though successful but it is not worth to recommended as the fungicidal control are costly and have severe health hazards causing environmental pollution. Besides, the beneficial, biocontrol agents of plant diseases present in the soil are most likely to be adversely affected resulting in ecological imbalance. The identification and cultivation of wilt resistance/tolerant cultivars is the only way to reduce the losses caused by the disease. Therefore, materials consisting of 97 lines/cultivars of bell pepper were screened under natural epiphytotic conditions in *Fusarium* sick plots showing cent percent wilt incidence on highly susceptible lines.

### Methods

The seedlings of 48 lines of bell pepper and 46 lines of paprika were screened at Vegetable Experimental Farm, S. K. University of Agricultural Sciences and Technology, Srinagar during *kharif* of 2004. Six week old seedlings after uprooting from nursery were dipped in spore suspension of *Fusarium pallidoroseum* (Cooke) Sacc. For 30 minutes and then planted in randomized block design with three replications at a spacing of 60 cm × 45 cm in *Fusarium* sick field where wilt incidence was almost cent percent in the previous and current seasons in highly susceptible line California Wonder. In each replication there were two rows of each genotype with ten plants in each row. The data on wilt incidence was recorded till final harvesting and percentage wilt incidence was worked out as

$$\text{Percentage wilt incidence (PWI)} = \frac{\text{Infected plants}}{\text{Total plants}} \times 100$$

and rated following Kesavan and Chowdhary (1) as Immune : 0% ; Highly resistant : 1-10% ; Resistant : 11-30% ; Moderately resistant : 31-50% ; Susceptible : 51-80% and Highly susceptible : 81-100%.

**Table 1.** Screening for resistance to *Fusarium pallidoroseum* (Cooke) Saac. under natural epiphytotic conditions. \*Grouping was done on the basis of percent wilt incidence obtained during 2004 and 2005 and categorized as immune (0%), highly resistant (1–10%), resistant (11–30%), moderately resistant (31–50%), susceptible (51–80%) and highly susceptible (81–100%).

Crop	Immune	Wilt disease rating				
		Highly resistant	Resistant	Moderately resistant	Susceptible	Highly susceptible
Bell Pepper	–	SP-21 SP-616 SP-617 SP-706	SP-3 SP-52 SP-608 SP-613	Nishat-1, DARL-204, Bull Nose Oskash, SP-2 SP-4, SP-5, SP-31, SP-203, SP-461, SP-461-1, SP-600, SP-609, SP-612, SP-615, SP-620, SP-624, SP-628, SP-631, SP-635, SP-643, SP-652, SP-705, SP-821,	KTCPH-5, KTCPH-3, SP-32 SP-601, SP-602, SP-603, SP-606, SP-607, SP-610, SP-623, SP-625, SP-633, SP-638,	California Wonder
Paprika	–	P-17 P-18 P-19	P-1-1, P-2-1, P-7, P-12, P-54-3, P-9, P-13, P-101, P-104, P-20, P-21, P-141, P-301, P-24-3, P-32, P-49, P-305, P-311	KT-PL-19, Byadagi Kaddi, Arka Abhir, Byadagi Dabbi, P-2, P-4, P-5, P-7-6,	P-1, P-37, P-82, P-211, P-219, 2, P-4, P-5, P-7-6,	1

## Results and Discussion

Results of screening are presented in Table 1. Among the lines/cultivars screened, no genotype either in bell pepper or in paprika were found to be

**Table 2.** Grouping of bell pepper and paprika lines against *Fusarium pallidoroseum* (Cooke.) Saac. on the basis of percent wilt incidence.

Group	Percentage wilt incidence	Number of lines in each group	
		Bell pepper	Paprika
1 Immune	0	Nil	Nil
2 Highly resistant	1–10	4	3
3 Resistant	11–30	4	11
4 Moderately resistant	31–50	24	24
5 Susceptible	51–80	15	5
6 Highly susceptible	81–100	1	Nil

immune to the disease. However, four lines, namely SP-21, SP-616, SP-617 and SP-706 in bell pepper were found to be highly resistant with wilt incidence ranging from 1 to 10%.

Under resistant category there were four lines in bell pepper SP-3, SP-52, SP-613 and SP-606 and 11 lines in paprika P-1-1, P-2-1, P-7, P-12, P-54-3, P-101, P-104, P-141, P-301, P-305 and P-311 with PWI ranging from 11–30%. These lines besides showing resistance also recorded high fruit yield and superior fruit quality, thus have been identified as potential genotypes for growing in wilt infested areas and can also be used as potential source of resistance for breeding wilt resistant cultivars. The screening of most solanaceous vegetables for resistance to *Fusarium* wilt has been carried out by different researchers, who reported varied degree of resistance to *Fusarium* wilt (2–7).

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