

CROSS PROTECTION AGAINST WILT DISEASE CAUSED
BY
FUSARIUM OXYSPORUM F. SP. *UDUM* IN PIGEON PEA.

By

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Induction of resistance to *Fusarium* wilt diseases by preinoculation of the hosts with some non-pathogenic isolates has been demonstrated by several workers. (Barlong, 1945 ; Davis, 1967 ; McClure, 1955 ; Perry, 1959). An experiment was undertaken in this laboratory to induce resistance to pigeon pea (*Cajanus cajan* (L.) Millsp) seedlings against wilt caused by *Fusarium oxysporum* f. sp. *udum* by prior inoculation with some other formæ speciales of *F. oxysporum*, the result of which are presented in the present note.

The formæ speciales of *F. oxysporum* other than *F. oxysporum* f. sp. *udum* (pathogen) used in this study are *F. oxysporum* f. sp. *ciceri* and *F. oxysporum* f. sp. *vesinfectum* (non-pathogens). The fungus cultures were grown in sucrose casamino acid medium at 27°C in petriplates. 8 discs (5mm. diam.) of the 10 days old cultures of the non-pathogens were cut and added to each of the 10 cm. long sterilized reagent bottles containing 60 ml. of nutrient solution supplemented with sterile distilled water. Each of these bottles, containing discs of 10 days old cultures of the non-pathogens was previously shaken with 10 ml. of nutrient solution supplemented with sterile distilled water for 15 minutes in a shaker to ensure proper mixing of the fungal spores with the nutrient solution.

Seedlings of pigeon pea var. EB—3 were raised in sterilized sand to which nutrient solution was regularly added. 7 days old seedlings were carefully taken out from sand, washed in sterile distilled water and a single seedling was transferred to each of the reagent bottles containing nutrient solution and inocula of *F. oxysporum* f. sp. *ciceri* and *F. oxysporum* f. sp. *vasinfectum* respectively. Each of these reagent bottles, with a single seedling, was loosely plugged with non-absorbent cotton and covered with black polythene paper for protecting passing of light inside. After 5 days the seedlings were taken out and inoculated in the same way

as above with *F. oxysporum* f. sp. *udum* (pathogen) in reagent bottles. For comparison, one set of seedlings were inoculated with *F. oxysporum* f. sp. *udum* and the other set was kept uninoculated. For each treatment 12 replicates were kept.

Disease symptoms appeared from 6 days onwards. The disease index is a number used to express the severity of the disease; it ranged from 0.00 (no symptom) to 4.00 (complete wilting and death of the seedling). The results are presented in Table 1, which shows that 77.50 to 81.25% control of pigeon pea wilt due to *F. oxysporum* f. sp. *udum* can be achieved by prior inoculation of the host with the non-pathogens *F. oxysporum* f. sp. *ciceri* and *F. oxysporum* f. sp. *vasinfectum*.

Further studies are under progress regarding nature of induced resistance.

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Table 1. Cross protection against *Fusarium* wilt of pigeon pea by non-pathogenic formæ speciales of *F. oxysporum*.

Treatments	Disease index*	Reduction of infection (%)**
<i>F. oxysporum</i> f. sp. <i>ciceri</i> × <i>udum</i>	0.90	77.50
<i>vasinfectum</i> × <i>udum</i>	7.75	81.25
<i>udum</i> (control)	4.00	
Uninoculated (control)	0.00	

* Disease index calculated 16 days after inoculation with *F. oxysporum* f. sp. *udum*.

** $100 - (\text{Disease index of doubly inoculated seedling}) \times \text{Disease index of seedling inoculated with } F. oxysporum \text{ f. sp. } udum \times 100$.

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