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Effects of Some Chinese Strains of Peanut Stripe Virus (PStV) on Groundnut Cultivars and Other Plants

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Peanut stripe virus (PStV) is an economically important virus infecting groundnut *(Arachis hypogaea)* in Southeast Asia. It is widely distributed in all groundnut production areas in China (Xu et al. 1984). Peanut stripe virus has assumed economic importance because of its potential to cause significant reductions to crop yields and in quarantine because of its relatively high frequency of transmission through groundnut seed. The virus has been reported to occur as distinct strains on the basis of symptoms in groundnut and host reaction (Wongkaew and Dollet 1990). During surveys in China wide variation in symptoms was noticed in PStV-infected groundnut. In this paper symptoms, seed transmission frequency, and pod losses due to some PStV isolates occurring in China are reported.

Symptomatology. Five isolates of PStV were collected from groundnut in Wuhan (PStV-W1, W2, N), Guangzhou (PStV-G) and Tansan (PStV-T). They were maintained on groundnut cv Honghua No. 1 in a glasshouse. Extracts from each isolate were mechanically sap inoculated on to different groundnut genotypes and on to a range of indicator plants (Table 1). On the basis of symptoms produced on various groundnut genotypes they were divided into three groups. Isolates included in group I caused mild mottling symptoms and very little stunting (PStV-WI and T). Isolates in group II (PstV-W2 and G) caused blotches and relatively more stunting than the isolates in group 1. Isolates in group III (N) were distinguished on the basis of necrosis of veins, severe mosaic symptoms, and stunting. All isolates in the three groups caused systemic mosaic on *Glycine max, Cassia occidentalis* (PStV-N not tested) and *Nicotiana benthamiana;* local lesions on Chenopodium *amaranticolor*, Cassia tora (PStV-N not tested), and cowpea. All isolates failed to infect *Sesbania exalta* and Phaseolus vulgaris cv Topcrop. None of the diagnostic hosts was suitable for distinguishing the isolates.

Effect on plant growth and pod yield. Two widely-distributed isolates in China (W1 and G) were chosen to study their effect on growth and yield of groundnut cultivars Zhonghua Nos. 1, 3, and 4 and Luhua No. 11, under glasshouse conditions. PStV-WI caused 1.4% to 6.4% reduction in height and G caused 9.2% to 16.3% reduction. Losses in pod yields due to PStV-WI ranged from 20.8% to 36.6% and decrease in pod yields due to PStV-G ranged from 29.8% to 55%. The cultivars Zhonghua Nos. 3 and 4 suffered maximum losses in pod yields by both the PStV isolates.

Seed transmission frequency. Nearly 1000 seeds were used to determine the rate of transmission to seed. PStV-WI was transmitted to 20.9% and PStV-G to 6.1% of seed of cv Zhonghua No. 3. However in cv Zhoughua No. 4 seed transmission rate was lower than that observed for Zhonghua No. 3 (6.1% for WI and none for G).

Aphid transmission. All five PStV isolates were transmitted by *Aphis craccivora* from groundnut to groundnut. The efficiency of transmission was 4.2% (1/24) for PStV-N, 12.0% (3/25) for PStV-G, 20.0% (5/25) for PStV-WI, 22.2% (6/27) for PStV-W2, and 44.0% (11/25) for PStV-T.

Conclusions

Five PStV isolates collected from various parts of China could be classified into three distinct groups on the basis

Table 1. Reactions to five PStV isolates following their transmission to host plants by mechanical sap inoculation.

Host plant	Group I PStV-WI,T	Group II PStV-W2, G	Group III PStV-N
Arachis hypogaea	Inoc./Systemic	Inoc./Systemic	Inoc./Systemic
cv Zhonghua No. 4	None/MMot.Str[1]	None/Blo,Str[1]	None/LN,Stu[1]
Yuhua No. 1	MMot/MMot	None/Bio	None/LN,Stu
Luhua No. 1	None/MMot,Str	None/Blo	None/LN,Stu
93904	MMot/MMot	None/Blo,Str	None/LN,Stu
79266	MMot/Str	None/Bio	None/LN,Stu
Glycine max cv 84-87	None/Mo	None/Mo	None/Mo
Zhangziwu	LLn/Mo,Cri	LLn/Mo	LLn/Mo,Cri
Zhongdu-24	None/Mo	None/Mo	None/Mo
Chenopodium amaranticolor	LLc/None	LLc/None	LLc/None
Cassia occidentalis	None/Mo	None/Mo	-[2]
Cassia tora	LLn/None	LLn/None	
Sesbania exalta	None/None	None/None	
Phaseolus vulgaris cv Topcrop	None/None	None/None	None/None
Cowpea	LLn/None	LLn/None	LLn/None
Nicotiana benthamiana	None/Mo	None/Mo	None/Mo

1. Blo = blotch, Cri = crinkle, LLc =local chlorotic lesions, LLn = local necrotic lesions, LN =leaf necrosis, Mmot = mild mottle, Mo = mosaic; Str = stripe, Stu - stunt.
2. Not tested.

of symptoms produced on different groundnut cultivars. Isolates in group I, which produced mild mottling symptoms, were found to be widely distributed. An isolate in group I (PStV-WI) showed relatively higher seed transmission frequency than an isolate in group II (PStV-G). In glasshouse tests PStV-G caused more reduction to pod yield than PStV-WI.

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