Research Paper :

Serological diagnosis of crop and weed plants for the presence of Sunflower Necrosis Virus (SNV) through Direct Antigen Coated- Enzyme Linked Immuno Sorbent Assay (DAC-ELISA)

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SUMMARY

Thirty nine crop plants and thirty seven weed plants belonging to different families were artificially inoculated with Sunflower Necrosis Virus (SNV) through sap and *Thrips palmi* (Karny), vector of SNV and were kept for symptom expression. These plants were then subjected to Direct Antigen Coated-Enzyme Linked Immuno Sorbent Assay (DAC-ELISA) analysis to detect the presence of the virus. Out of thirty nine crop plants, nine of them showed positive reaction, where as out of thirty seven weed plants, twenty four of them gave positive reaction indicating the presence of SNV in them. The above results thus proved that these positively reacted crop and weed plants act as collateral hosts to SNV and further help in the spread and survival of this virus during off season.

Key words : Sunflower necrosis virus, *Thrips palmi*, Crop plants, Weeds, DAC-ELISA

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Sunflower (*Helianthus annuus* L.), a member of Asteraceae, is one of the important oilseed crops of the world and ranks third, after soybean and groundnut in area and production. Sunflower is reported to be susceptible to several diseases caused by various agents. However, off late a new virus disease on sunflower showing necrotic symptoms has been reported to occur around Bangalore (Anonymous, 1997 and Singh *et al.,* 1997). Surveys conducted in some parts have indicated that the disease incidence ranged from 5-80% and thus is of great importance (Anonymous, 2006). In general, the viral diseases are known to be associated with several crop plants and weeds causing symptoms specific on the main crop infected. SNV was reported to infect several crops and weed species present in and around sunflower fields (Ajith Prasad and Nagaraju, 2005 a and b and Lokesh, 2006). Thus, the objective of this study was to understand the sudden occurrence and spread of the disease and to determine the host range of the virus and thrips prevailed on them.

MATERIALS AND METHODS

The experiment was carried out to detect the presence of SNV in different crops and weed species. Ajith Prasad and Nagaraju (2005a) investigated and proved the transmission of SNV through mechanical inoculation and *T. palmi*. Accordingly, thirty nine healthy crops and thirty seven healthy weed plants were first inoculated with SNV through mechanical sap and its vector, *Thrips palmi* under lab conditions at two leaves stage. The inoculated seedlings were left undisturbed for symptom expression.

Prasada Rao *et al.* (2000) concluded that the causal virus of Sunflower Necrosis Disease (SND) was a strain of Tobacco Streak Virus (TSV) belonging to *Ilarvirus* group. This conclusion was based on the serological reaction with tobacco streak virus antiserum, molecular weight of virus coat protein and nucleic acid species analysis. Thus, for antigen coated enzyme linked immunosorbent assay (DAC-ELISA) Tobacco streak virus antisera and alkaline phosphatase (ALP) enzyme and p-nitrophenylphosphate (pNPP) system were employed.

Crude plant extract was prepared in coating buffer using dilution of 1:100 (100 mg of leaf sample /1 ml buffer). The filtered extract was dispensed into each well of ELISA plate at the rate of 100 µl using a micropipette and the plate was incubated at 37^0 C for 1 hour.