Research Paper :

Virus vector relationship studies of Sunflower Necrosis Virus (SNV) and its vector *Thrips palmi* (Karny)

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SUMMARY

In the present study, investigations were made to establish the precise virus-vector relationship for which initially the transmission of Sunflower Necrosis Virus (SNV) through *Thrips palmi* (Karny) was determined. The results revealed that the vector *Thrips palmi* (Karny) could acquire the virus with an Acquisition Access Period (AAP) of 3 days from the cotyledonary leaves of an infected sunflower plant, with a resultant 16.67% transmission. Similarly, Inoculation Access Period (IAP) of 6 days was necessary for successful transmission of the virus with 13.33 % transmission of the virus. The percentage of transmission increased with increase in both acquisition and inoculation feeding period. Further, it was observed that a single thrip was enough to acquire and transmit the virus from an infected to healthy sunflower plant.

Key words : Sunflower necrosis virus (SNV), *Thrips palmi* (Karny), Thrips transmission, Acquisition access period (AAP), Inoculation access period (IAP).

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Sunflower is one of the important crops that has contributed to rapid growth in oilseed production during late eighties and early 1990s in India. Sunflower is the oil of preference among the consumers world over due to its health appeal and in India too, sunflower oil is the largest selling oil in the branded oil segment. However, sunflower production has been severely affected due to its infection by Sunflower Necrosis Virus (SNV). This necrosis disease on sunflower was observed in serious proportion in parts of Karnataka during summer in 1997 (Nagaraju *et al*., 1998). Further, the disease incidence was reported from several parts of Karnataka *viz*., Dharwad, Raichur, Chitradurga, Haveri, Ranebennur, Naragund, Gadag, Tumkur and Kolar districts (Anonymous, 1998). This disease is caused by Sunflower necrosis virus which belongs to genus *Ilarvirus* related to tobacco streak virus. The disease was characterized by necrosis of leaves followed by necrosis on petioles, stem and floral calyx (Jain *et al.,* 2000).

The virus is transmitted through mechanical sap inoculation from infected plant to a healthy one (Linga Reddy, 2003). Further, it was observed that among the different insect species, aphids (*Myzus persicae*), jassids (*Empoasca kerri*) and whiteflies (*Bemisia tabaci*) failed to transmit the virus (Halakeri, 1999). Whereas *Thrips palmi* (Karny) was reported to transmit SNV successfully to healthy sunflower plants (Anjula, 2000, Aravind, 2002). However, different threshold periods of vector for virus acquisition, inoculation and minimum number of thrips for transmission of SNV need to be studied. Therefore, present investigations were emphasized to find the same.

MATERIALS AND METHODS

Confirmatory studies on SNV transmission through *Thrips palmi*:

Test plants (genotypes Morden, KBSH-1 and KBSH-44) rose in insect proof nylon mesh cages were used in transmission experiments. The healthy colonies of *T. palmi* maintained on sunflower, green gram and peanut plants by weekly transfer of active nymphs were used for transmission studies.

Young sunflower leaves showing clear symptoms were kept in the Petriplate. Along the rim of Pertriplate, a thin layer of water was poured and about 20-30 nymphs were released onto such leaves using fine hair brush. Nymphs fed on healthy leaves served as check. After three days, 20-25 nymphs were transferred using fine hairbrush on to test plants raised in insect proof wooden cages. Sunflower seedlings at two leaves stage were used for the experiment. The normal movement of thrips was observed to ensure that injury do not occur