**ABSTRACT**

*Tobacco streak virus* (TSV) emerged as serious threat to sunflower and groundnut cultivation in India in the recent years. Survey conducted during 2002 to 2004 in the predominant sunflower and groundnut growing regions of Andhra Pradesh, Maharashtra, Karnataka and Tamil Nadu revealed the wide prevalence of TSV in South Central India. Apart from sunflower and groundnut, TSV infection was observed in oilseed (soybean, safflower, sesame), vegetable (okra and gherkin), fibre (cotton), legumes (cowpea and mungbean), ornamentals and several weed species. Maximum disease incidence in sunflower, groundnut, okra, cotton and soybean was recorded up to 95%, 80%, 20%, 25% and 40%, respectively. Symptoms upon TSV infection varied from chlorosis to necrosis depending on crop/genotype, stage of plant at the time of infection etc. Under green house conditions, TSV is transmitted by mechanical sap inoculations, pollens but not by seeds. In a host range study, a representative sunflower isolate from Jalna (TSV-SF Jln-02) infected 29 out the 33 plant species tested under green house condition. Virus was purified by PEG precipitation and linear sucrose gradient centrifugation and on SDS-PAGE the purified virus resolved into a major polypeptide of ~28 kDa. On a denaturing agarose gel, the viral RNA extracted from purified virus resolved into six distinct bands. RNA3 of TSV-SF Jln-02 was amplified, cloned and sequenced. RNA3 sequence of TSV-SF Jln-02 isolate shared 88.2% sequence homology with the RNA3 of type strain, TSV-WC. To determine the sequence diversity of TSV isolates in India, the coat protein gene from 52 TSV isolates collected from different crops and locations were sequenced. Sequence analysis revealed a high degree (98 to 100%) of sequence conservation in the CP gene sequences among various TSV isolates prevalent in India. The Indian isolates shared 88-89% and 79-80% sequence homology with the TSV-WC (United States) and TSV-BR (Brazil), respectively. The CP was over expressed, purified and used in polyclonal antibody production. Serological techniques were optimized for detection of TSV. To develop a control strategy against TSV, the conserved CP gene under the control of CsVMV promoter was transformed into tobacco using *Agrobacterium* mediated transformation. Evaluation of T1, T2 and T3 progenies was carried out under green house condition to establish the proof of coat protein mediated resistant strategy against the Indian TSV isolate.