GRAFT-TRANSMISSIBLE VIRUS RESISTANCE IN TOBACCO

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RNA silencing in conserved mechanism in eukaryotes involved in defense against viruses and transposons. RNA silencing is triggered by double stranded (ds) RNA which can come from transgenic genes, endogenous genes, or viruses. The dsRNA is processed into 21-25 nt small interfering (si) RNAs by the activity of an RNase III like enzyme called Dicer. The si RNA is then incorporated into a RNA-induced silencing complex (RISC), so ensuring that is specifically degrades any RNA sharing sequence similarity with the inducing dsRNA. In the present investigation, we studied the graft transmission of RNA silencing based resistance against *Cucumber mosaic virus* (CMV). Transgenic tobacco lines carrying dsRNA hairpin constructs targeting the 2b gene of CMV were used as rootstocks and scions. Micrografting of selected lines was done at seedling stage using CMV immune transgenic lines (2bihp1, 2bihp15, 2bihp24, and 2bihp47) as scions. Transmission of resistance was recorded only in case of 2bihp1 as scions grafted on 2bihp19 or 2bihp44. In all other grafts, the scions remained susceptible after grafting. Presence of siRNA (21-24nt) was detected in the parent lines 2bihp19 and 2bihp44. However, in 2bihp1, siRNAs (24nt) only were detected. In all other susceptible parent lines, we could not detect any siRNAs (21nt – 24nt). After grafting, we were able to detect 21-24nt siRNAs in 2bihp1 scions grafted on 2bihp19 as well as 2bihp44. All other grafted scions showed no siRNAs. Therefore, the presence or absence of siRNA may not be an indicator of virus resistance. The mechanism of transfer of RNA silencing based resistance needs to be investigated further to get an insight into the genes involved in reception of the signal.