

Assessment of virus resistance in transgenic *Nicotiana tabacum* cv. Samsun lines against three Iranian isolates of potato virus Y

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ABSTRACT

Tobacco plants (*Nicotiana tabacum* cv. Samsun) were transformed by coat protein gene of potato virus Y necrotic strain (PVY^N-CP) using pBIN19 binary vector and Agroinoculation method. The primers designed so that the inserted PVY-CP transgene had not any start codon and so, it was unable to be translated into coat protein product. Resistance of 31 transgenic *Nicotiana tabacum* cv. Samsun lines containing PVY^N coat protein transgene (PVY^N-CP), were evaluated against the mechanical challenge inoculation of 3 prevalent Iranian PVY strains. On the basis of biological and serological properties, these PVY isolates included PVY_n-H, PVY_n-Mz (necrotic strain of PVY) and PVY_o-Ar (an Ordinary strain). Symptom evaluation and ELISA tests showed that after challenge inoculation of 31 transgenic lines with PVY_n-H, PVY_n-Mz and PVY_o-Ar isolates, 5, 4 and 0 lines showed resistant phenotype, 9, 10 and 2 lines showed moderate symptoms of the disease and 17, 17 and 29 lines showed susceptible phenotype, respectively. Using TAS-ELISA and Western-blot analysis, the protein product of PVY^N-CP transgene could not be detected in any of 31 transgenic lines. It seems that an RNA mediated resistance is responsible for resistance in the PVY-CP transgenic tobacco plants. In *Nicotiana* species, natural resistance sources to PVY infection are poor and development of engineered resistance sources against PVY infections would be useful.

Key words: Potato virus Y, Coat Protein, Cloning, Transformation, Agroinoculation, Transgenic Plant Resistance, Iranian PVY strains, Engineered resistance.

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