

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

**R. POURRAHIM<sup>1,5</sup>, A. AHOONMANESH<sup>2</sup>, H. HASHEMI<sup>3</sup>,  
S. ZEINALI<sup>4</sup> and S. FARZADFAR<sup>5</sup>**

- 1- Islamic Azad university of Tehran, 2- Isfahan University of Technology,  
3- National Research Center for Genetic Engineering and Biotechnology, Tehran,  
4- Biotechnology Dept., Pasteur Institute of Iran, Tehran.  
5- Plant Pests and Diseases Research Institute, Tehran

**ABSTRACT**

Tobacco plants (*Nicotiana tabacum* cv. Samsun) were transformed by coat protein gene of potato virus Y necrotic strain (PVY<sup>N</sup>-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<sup>N</sup> coat protein transgene (PVY<sup>N</sup>-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<sub>n</sub>-H, PVY<sub>n</sub>-Mz (necrotic strain of PVY) and PVY<sub>o</sub>-Ar (an Ordinary strain). Symptom evaluation and ELISA tests showed that after challenge inoculation of 31 transgenic lines with PVY<sub>n</sub>-H, PVY<sub>n</sub>-Mz and PVY<sub>o</sub>-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<sup>N</sup>-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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**Address of the authors:** R. POURRAHIM, Plant Pathology Dept., Islamic Azad university of Tehran, and Plant Virology Dept., Plant Pests and Diseases Research Institute, P. O. Box 1454, Tehran 19395, Iran; A. AHOONMANESH, Plant Pathology Dept., Isfahan University of Technology, Isfahan, Iran; H. HASHEMI, National Research Center for Genetic Engineering and Biotechnology, Tehran, Iran; S. ZEINALI, Biotechnology Research Center, Pastor Institute of Iran, Tehran, Iran; SH. FARZADFAR, Plant Virology Dept., Plant Pests and Diseases Research Institute, P. O. Box 1454, Tehran 19395, Iran.