



Resistance-Breaking Isolates of *Beet necrotic yellow vein virus* (BNYVV) Collected from Sugar Beet Fields in the Northern, Eastern and Central Parts of Turkey

Nazli Dide Kutluk Yimaz¹, Miray Arli Sokmen¹, Riza Kaya², Yusuf Toksoz, Berna Tunali¹, Ebru Erkan¹, Mehmet Ali Sevik¹,

¹*Ondokuz Mayıs University, Agricultural Faculty, Department of Plant Protection, Samsun-Turkey.*

²*Sugar Institute, Department of Phytopathology, Ankara-Turkey*

Abstract

A hundred twenty two sugar beet (*Beta vulgaris*) soil samples were collected from ten provinces in the northern, eastern and central parts of Turkey in 2004-2005 and 2010-2011. *Beet necrotic yellow vein virus* (BNYVV) was detected in 74 of the samples by bait plant test and DAS-ELISA. Also, during the surveys in these regions, it was noticed that some sugar beet fields planted with partially BNYVV-resistant cultivars expressed severe rhizomania symptoms. Of the tested soil samples, 75.7% (56 samples) contained high virus titre in partially resistant cv. Esperanza in bait plant test. This study indicated that the resistance-breaking isolates existed in these regions.

Ten soil samples were selected according to their symptom expression and geographic origins and used in RT-PCR studies using the primers specific to the capsid protein and P25 protein genes of BNYVV. All isolates were A type strain based on RFLP analysis. Partial nucleotide sequences of RNA-3 involving P25 coding region of ten BNYVV isolates were obtained. Aminoacid tetrad position 67-70 of P25 protein, responsible for symptom expression and pathogenicity, were analyzed, and four different BNYVV variants with the motifs of "ACHG", "AHHG", "VCHG" and "AHAG" were determined. "AHAG" motif was a new motif for BNYVV populations in the world. Resistance breaking isolates consisted of three types of motifs (ACHG, AHHG, VCHG) in P25 coding region and belonged to Çorum, Tokat, Çankırı and Amasya provinces. The isolates with "ACHG" and "AHHG" motifs showed different pathogenicity with mostly chlorosis type of symptom as well as necrotic lesion and leaf deformation on sugar beet seedlings of rhizomania susceptible cv. Kasandra, whereas the isolate with "VCHG" motif showed dark green vein banding and leaf deformation. The other isolate, which did not break resistance, had "AHAG" motif and also caused chlorosis on sugar beet leaves. These results revealed that the BNYVV isolates occur in the region have different genetic profile and pathogenicity.