

Biological and Molecular Characterization of Some Zucchini yellow mosaic Virus Isolates from Southern Syria and Jordan Valley

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Abstract

Zucchini yellow mosaic virus (ZYMV) is an important viral pathogen of squash plants. This study was conducted during the growing seasons of (2005/2006-2006/2007) to differentiate between 5 ZYMV isolates obtained from southern Syria (3) and Jordan Valley (2) using biological and molecular techniques. The nomenclature of the virus isolates was as follows: JOR-N1, SYR-N2, JOR-N3, SYR-N4, SYR-N5. Indicator plants reacted differently when they were inoculated with these isolates. Isolates JOR-N1, JOR-N3 and SYR-N4 induced chlorotic local lesions on *Chenopodium amaranticolor* and *C. quinoa*, whereas red to pink local lesions were observed on plants inoculated with SYR-N2 and SYR-N5 isolates. On *Cucurbita pepo*, JOR-N1 isolate caused mild mosaic and vein yellowing while, isolate SYR-N2 induced severe mosaic and blister. Isolate JOR-N3 caused mosaic and leaf deformation. Squash plants inoculated with SYR-N4 developed chlorotic local lesions and mosaic symptoms while, SYR-N5 induced leaf deformation and blister. Total RNA isolation was extracted from squash plants infected with JOR-N1, SYR-N2, JOR-N3, SYR-N4, SYR-N5 isolates and oligonucleotide primer pair ZYMVfor/ZYMVrev was used to amplify a fragment of about 395bp of the coat protein gene of ZYMV. Sequence analysis of the amplified PCR product showed that JOR-N3 isolate shared high (100%) nucleotide identity with the Japanese isolate (AB004641) of ZYMV, while, the nucleotide similarity of the other isolates ranged between 97% and 99%. On the other hand, the nucleotide sequence similarities between the five isolates studied in this work and ZYMV isolates from Slovakia, Germany and South Africa ranged between 97% and 99%. The lowest sequence similarity of the five isolates was recorded with ZYMV isolate from Chili. Sequence analysis of amino acids indicated that the five isolates shared high (96-100%) identities with each other, and 94-98% when compared with the Chili isolate.

Keywords

ZYMV isolates, southern Syria, Jordan Valley, squash viruses