

DETECTION, DISTRIBUTION, AND PURIFICATION OF MAJOR POTYVIRUSES OF ZUCCHINI SQUASH IN IRAN

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Viral diseases of zucchini squash are among the most important and destructive diseases of this crop, causing severe damage every year. Viruses in the potyvirus genus (Potyviridae family), including zucchini yellow mosaic virus (ZYMV), watermelon mosaic virus-1 (WMV-1), and watermelon mosaic virus-2 (WMV-2), are the major viruses infecting zucchini squash worldwide. In the present study, successive sampling was carried out from zucchini plants with symptoms such as mosaic, malformation and colour breaking of leaf and fruit, and fruit blistering at different growth stages in the main growing areas of zucchini squash located in Khorasan-razavi province of Iran. Detection of ZYMV, WMV-1, WMV-2 was based on double antibody sandwich-enzyme linked immunosorbent assay (DAS-ELISA). The infected samples with ZYMV, WMV-1, and WMV-2 were 186, 98, and 134 out of 500 collected samples respectively. Some of the samples showed infection with both WMV-1 and WMV-2 viruses simultaneously, indicating that the investigated viruses can not cross-protect each other. Thermal inactivation point, longevity in vitro, and dilution end point were determined for each virus. The most destructive virus was ZYMV with the widest host range determined using differential indicator plants, and WMV-2 was more destructive than WMV-1. The viruses were purified using polyethylene glycol (PEG)-6000 and centrifugation in caesium chloride gradient. The purification was confirmed by spectrophotometry and coat protein investigation using Sodium Dodecyl Sulphate-PolyAcrylamide Gel Electrophoresis (SDS-PAGE), that showed a protein bands with molecular weight of 36.391 and 34.047 kDa which are specific for ZYMV and WMV-2, respectively.