

Identification of tomato bushy stunt virus on Geranium in central province, Iran

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Geranium (*Pelargonium × hortorum*) plants showing stellate yellow and necrotic spots with curled young leaves were observed in various greenhouses in Mahallat area during the winter 1999-2000. The symptoms usually were not observed in leaves which later formed during the summer. Leaf samples were extracted in 2 vol. of 0.1M phosphate buffer pH 7 containing 0.2% sodium sulphite and 0.05M PVP and mechanically inoculated to test plants of *Chenopodium amaranticolor*, *C. quinoa* and *Gomphrena globosa*. Infected plants induced chlorotic local, and systemic spots and reddish-rimmed whitish rings on the test plants, respectively. Electron microscopy of negatively stained leaf-dip preparations of infected *C. quinoa* with 1% uranyl acetate showed the presence of isometric virus particles associated with the disease and resembling that of tomato bushy stunt virus (TBSV). On the basis of the reaction of test plants and electron microscopic observation, the virus isolated from Geranium was identified as TBSV. This is the first report of the occurrence of the virus in the central province, Iran.

improving agent has an interacting effect with cytokinins. In a particular range, rhizogenic improvement could be obtained by the simultaneous application of these hormones. However in some cases, rhizogenesis could be obtained without addition of any hormones. Also application of cytokinin BA inhibited the formation of roots and offset the effects of auxins for rooting. However, in particular concentrations of cytokinins, together with auxins helped root formation and root growth in length.