



Report of a new begomovirus on melon in Iran

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Melons (*Cucumis melo*; family *Cucurbitaceae*) are important horticultural crops extensively grown in commercial greenhouses, plastic tunnels and open farms in many areas of Iran. During a survey performed in the spring and winter of 2012, a total of 25 leaf samples were collected from melon plants showing virus-like symptoms of mosaic, mottling, chlorosis, yellowing, leaf curling and leaf deformation in the Khuzestan province of Iran. Leaf samples were tested by double-antibody sandwich enzyme-linked immunosorbent assay (DAS-ELISA) using the broad-spectrum reacting *Tomato yellow leaf curl virus* (TYLCV) antibodies (Bioreba, Switzerland), according to the manufacturer's instruction. Two samples collected from Hamidiyeh (Ahwaz, Khuzestan) reacted weakly in ELISA to the antibodies. Mosaic and leaf deformation symptoms were associated with begomovirus infection (Fig. 1). Viral infection of the samples was tested by polymerase chain reaction (PCR) amplification using previously described universal primers that amplify DNA A of begomoviruses, Begomo F and Begomo R (Akhter *et al.*, 2009). The PCR reaction, in agreement with the ELISA tests, resulted in the specific amplification fragments of the expected size of *ca.* 2.8 kb for one of the samples tested.

To confirm these observations, partial nucleotide sequences of the DNA amplicons derived from the isolate, nominated Kz-Me198, were determined using the primer Begomo R and deposited in GenBank (Accession No. KF177232). BLAST analysis confirmed begomovirus infection of the sample and showed 100% identity with *Tomato leaf curl New Delhi virus* (ToLCNDV) (KC874509, KC874507 and AM850115). Phylogenetic analysis of the nucleotide sequence and the corresponding regions of other begomoviruses available in GenBank, including those isolated from Iran and India, revealed that the isolate Kz-Me198 together with some isolates of ToLCNDV fall into a separate cluster (Fig. 2). ToLCNDV has a wide host range, including pepper, potato, tomato and cucurbit plants (Hussain *et al.*, 2005). *Watermelon chlorotic stunt virus* and *Tomato leaf curl Palampur virus* have been previously reported to

infect cucurbit plants in Iran (Kheyri-Pour *et al.*, 2000; Heydarnejad *et al.*, 2009); these viruses induce chlorosis, yellowing, stunting and leaf curl symptoms on the affected plants and are different from those that observed for Kz-Me198. To our knowledge, this study reports the natural occurrence of a new begomovirus on melons in the mid-Eurasia of Iran.

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References

- Akhter A, Qazi J, Saeed M, Mansoor S, 2009. A severe leaf curl disease on chillies in Pakistan is associated with multiple begomovirus components. *Plant Disease* **93**, 962. [http://dx.doi.org/10.1094/PDIS-93-9-0962B]
- Heydarnejad J, Mozaffari A, Massumi H, Fazeli R, Gray AJA, Meredith S, Lakay F, Shepherd DN, Martin DP, Varsani A, 2009. Complete sequences of tomato leaf curl Palampur virus isolates infecting cucurbits in Iran. *Archives of Virology* **154**, 1015-1018. [http://dx.doi.org/10.1007/s00705-009-0389-6]
- Hussain M, Mansoor S, Iram S, Fatima AN, Zafar Y, 2005. The nuclear shuttle protein of *Tomato leaf curl New Delhi virus* is a pathogenicity determinant. *Journal of Virology* **79**, 4434-4438. [http://dx.doi.org/10.1128/JVI.79.7.4434-4439.2005]
- Kheyri-Pour A, Bananej K, Dafalla GA, Caciagli P, Noris E, Ahoonmanesh A, Lecoq H, Gronenborn B, 2000. *Watermelon chlorotic stunt virus* from the Sudan and Iran: sequence comparisons and identification of a whitefly-transmission determinant. *Phytopathology* **90**, 629-635. [http://dx.doi.org/10.1094/PHYTO.2000.90.6.629]



Figure 1

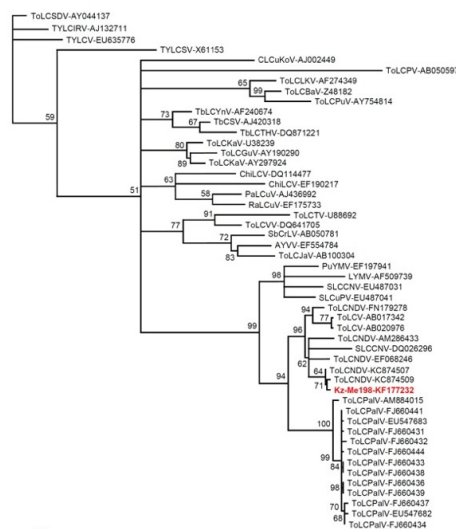


Figure 2

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