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DISEASE NOTES

First Report of *Cucumber green mottle mosaic virus* in Snake Gourd (*Trichosanthes cucumerina*) in India

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Cucumber green mottle mosaic virus (CGMMV) is a highly transmissible virus of the family *Virgaviridae* and the genus *Tobamovirus*. A loss of 10 to 15% was reported due to CGMMV

infection in cucumber grown in greenhouses in Canada (1) and in China (4). Infected samples of cucumber, bottle gourd, and cantaloupe consisted of young fully expanded leaves showing symptoms of mottling, systemic mosaic, mild to severe yellow mottling, vein clearing, and blistering (3). During a field survey conducted to document the viruses infecting cucurbitaceous crops in Tamil Nadu State during 2014, a snake gourd field near Coimbatore was identified with symptoms of virus diseases: mosaic, mottling with reduction of leaf size, and phylloid flowers. *Nicotiana glutinosa* plants inoculated with crude sap extracts from symptomatic leaves of snake gourd showed systemic mosaic mottling symptoms, indicating the presence of a mechanically transmissible virus. Symptomatic leaf samples from snake gourd and *N. glutinosa* tested positive in the dot-immunobinding assay with the CGMMV antibody (DSMZ, Germany), but asymptomatic leaves failed to show a positive reaction. In addition, the analysis by a tissue-blot immunobinding assay was also positive for CGMMV only in symptomatic leaves but not in asymptomatic leaves. To confirm these results, total nucleic acids extracted from both symptomatic snake gourd and *N. glutinosa* leaves along with asymptomatic leaves were subjected to reverse transcription (RT)-PCR using newly designed CGMMV-specific (GK CGMMV F: 5'-TAAGCGGCATTCTAAACCTCCA-3' and GK CGMMV R: 5'-CACTATGCACTTTGGTGTGC-3') corresponding to the complete coat protein (CP) gene of the

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virus. A single DNA band of approximately 604 bp amplified from symptomatic leaves (but not in asymptomatic leaves) of two independent plants was cloned separately into a pGEM-T Easy Vector System (Promega, USA). Two independent clones per amplicon were sequenced from both orientations. The pairwise comparison of the nucleotide sequences of these two clones showed 100% identity. Pairwise comparison of these sequences with corresponding nucleotide sequences of CGMMV in GenBank (KJ729039) showed 98% identity in the CP region with CGMMV sequences from France (AJ429090), Japan (AB015146 and V01551), and 97 to 98% identity with isolates from India (DQ767631, AJ748352, EU366912, DQ767636, and JQ712998). These results confirmed the presence of CGMMV in symptomatic leaves of snake gourd and *N. glutinosa*. The occurrence of CGMMV was reported in bottle gourd and musk melon earlier in India (2). To our knowledge, this is the first documented serological and molecular evidence for the occurrence of CGMMV in snake gourd in India.

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Section:

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