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# plant disease

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## Disease Notes

### First Report of *Cucumber green mottle mosaic virus* on Melon in the United States

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In July 2013, a melon (*Cucumis melo* var. Sasaki) field in Yolo County, California, was inspected as part of a phytosanitary inspection for seed production. The leaves of the plants showed mosaic, green mottle, and blotches. When plant sap was examined using a transmission electron microscope, rigid rod-shaped particles were observed. Melon plant samples were analyzed by both CDFA and USDA APHIS PPQ laboratories and tested positive using DAS-ELISA against *Cucumber green mottle mosaic virus* (CGMMV) (Agdia, Elkhart, IN). To confirm the presence of CGMMV, total RNA was analyzed by RT-PCR using primers CGMMV-F5370 5'-CTAATTATTCTGTCGGCTGCGGATGC-3' and CGMMV-R6390 5'-CTTGCAAGTACTGCCATA-3' designed by PPQ based on 21 genomic sequences of CGMMV found worldwide. The 976-bp amplicon was sequenced (GenBank Accession No. KJ453559) and BLAST analysis showed the sequence was 95% identical to MP and CP region of CGMMV isolates reported from Russia (GQ495274, FJ848666), Spain (GQ411361), and Israel (KF155231), and 92% to the isolates from China (KC852074), Korea (AF417243), India (DQ767631), and Japan (D12505). These analyses confirm the virus was CGMMV. To our knowledge, this is the first report of CGMMV in the United States. Based on our sequence data, a second set of primers (CGMMV-F5796 5'-TTGCGTTTAGTGCTTCTTATGT-3' and CGMMV-R6237 5'-GAGGTGGTAGCCTCTGACAGA-3'), which amplified a 440-bp amplicon from CGMMV CP region, was designed and used for testing all the subsequent field and seed samples. Thirty-seven out of 40 randomly collected Sasaki melon samples tested positive for CGMMV, suggesting the virus was widespread in the field. All the melon samples also tested positive for *Squash mosaic virus* (SqMV) using DAS-ELISA (Agdia). Therefore, the symptoms observed likely resulted from a mixed infection. The melon field affected by CGMMV was immediately adjacent to fields of cucumber (*Cucumis sativus* var. Marketmore 76) and watermelon (*Citrullus lanatus* var. Sugar Baby) crops, both for seed production with no

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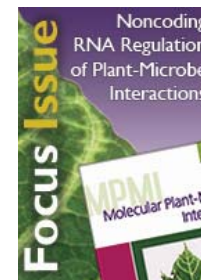


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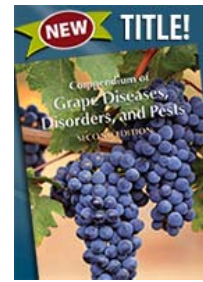
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barrier between the crops. CGMMV was also detected from symptomatic plants from both fields. Seed lots used for planting all three crops were tested and only the melon seed was positive for CGMMV, suggesting the seed as the source of infection. The sequenced 440-bp RT-PCR amplicons from CGMMV-infected cucumber and watermelon plants and melon seeds were 99% identical to the CGMMV from the field melon. A cucumber plant infected with CGMMV but not SqMV was used for mechanical inoculation at the Contained Research Facility at University of California, Davis. Inoculated cucumber, melon, and watermelon plants showed green mottle and mosaic similar to that observed in the field. CGMMV is a highly contagious virus and damage by this virus on cucurbit crops has been reported in regions where CGMMV is present (2). CGMMV was detected on cucumber grown in greenhouses in Canada with 10 to 15% yield losses reported due to this virus (1). The three cucurbit crops in Yolo County were planted in an isolated area with no other cucurbits nearby. Measures, including destroying all the cucurbit plant material, have been taken to eradicate the virus. Use of CGMMV free cucurbit seed is necessary for prevention of this disease.

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