# First report of tobacco rattle virus and cucumber mosaic virus in Phlox paniculata in France

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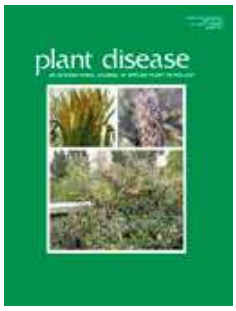



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## Disease Notes

# First Report of *Tobacco rattle virus* and *Cucumber mosaic virus* in *Phlox paniculata* in France

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*Phlox paniculata* L., a perennial plant from the family Polemoniaceae, is cultivated as an ornamental in gardens and for cut-flower production. In spring 2003, two types of symptoms were observed in *P. paniculata* plants grown for cut flowers on a farm in the Var department, France. Some plants showed a mild leaf mosaic while others showed leaf browning and delayed growth. In plants showing mild mosaic, *Cucumber mosaic virus* (CMV) was detected on the basis of the symptoms exhibited by a range of inoculated plants, the observation of isometric particles (approximately 30 nm) with the electron microscope in crude sap preparations from the infected plants, and the positive reaction in double-antibody sandwich (DAS)-ELISA to polyclonal antibodies raised against CMV (1). In double-immunodiffusion analysis, the five tested isolates were shown to belong to group II of CMV strains. To determine if CMV was responsible for the symptoms observed, one isolate was multiplied in *Nicotiana tabacum* cv. Xanthi-nc plants after isolation from local lesions on *Vigna unguiculata* and mechanically inoculated to 12 1-year-old *P. paniculata* plants. At 3 months post inoculation (mpi), all plants showed mild mosaic and CMV was detected by DAS-ELISA. In sap preparations from *P. paniculata* plants showing leaf browning symptoms, rod-shaped particles with two distinct sizes of 190 to 210 and 70 to 90 nm long, typical of those associated with tobraviruses, were revealed using electron microscopy. Local lesions typical of *Tobacco rattle virus* (TRV) were observed after inoculation of *N. tabacum* cv. Xanthi-nc, *Chenopodium amaranticolor*, and *C. quinoa*. Total nucleic acid preparations were prepared from symptomatic plants, and amplicons of the expected size (463 bp) were generated by reverse-transcription (RT)-PCR using primers specific to TRV RNA 1 (4). The nucleotide sequence of one amplicon was 93.6% identical to the sequence of a reference TRV isolate (GenBank Accession No. AJ586803). Twelve 1-year-old *P. paniculata* plants were mechanically inoculated with an extract of infected tissues from one symptomatic *P. paniculata* plant. TRV was detected 2 to 6 mpi in apical leaves of all inoculated plants by RT-PCR, although the plants did not express symptoms. Since no other pathogens were detected in the source plants, it is plausible that the lack of symptoms in back-inoculated plants is either due to a long incubation period or an interaction with particular environmental factors such as cold conditions. The survey of approximately 200 plants revealed that approximately 7, 10, and 1% were infected by TRV, CMV, or by both viruses, respectively. CMV and TRV were previously detected in *P. paniculata* in Latvian SSR and in Lithuania (2,3). These results show that sanitary selection of *P. paniculata* prior to vegetative propagation should include a screening for TRV and CMV infections.

*References*: (1) J.-C. Devergne et al. Ann. Phytopathol. 10:233, 1978. (2) Y. Ignab and A. Putnaergle. Tr. Latv. S.-Kh. Akad. 118:27, 1977. (3) M. Navalinskiene and M. Samuitiene. Biologija 1:52, 1996. (4) D. J. Robinson. J. Virol. Methods 40:57, 1992.