

First Report of *Tobacco rattle virus* Associated with Corky Ringspot in Potatoes Grown in North Dakota

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Tobacco rattle virus (TRV) belongs to the genus *Tobravirus* and causes a stem mottle of potato (*Solanum tuberosum*) foliage and necrotic arcs and rings in tubers referred to as corky ringspot. This virus is generally transmitted by a number of species of stubby-root nematode. The virus is widespread and has been reported in California, Colorado, Florida, Idaho, Michigan, Oregon, Washington, Minnesota, and Wisconsin (2). In the spring of 2009, we received potato tubers of cv. Russet Burbank with internal necrotic arcs very similar to those caused by TRV from potato storages located in Grand Forks and Dickey counties of North Dakota. Total RNA was extracted from the necrotic lesions of two tubers from each location using the Total RNA Isolation kit (Promega Corp., Madison WI). These extracts were tested for TRV by reverse transcription (RT)-PCR using primers complementary to nucleotides 6555 to 6575 (Primer A) and identical to nucleotides 6113 to 6132 (Primer B) within the 3' terminus of TRV-SYM RNA-1 (GenBank Accession No. X06172) (3). The expected 463-bp amplicons from two separate tuber samples from each county were cloned (TOPO Cloning; Invitrogen, Carlsbad, CA) and sequenced. The sequences obtained from the four clones at both locations were found to be identical to each other and were 99% identical to the corresponding regions of TRV isolates from Michigan and Florida (GenBank Accession Nos. EU315226.1 and AF055912.1, respectively). Since sequences from all four clones were identical, only one of the sequences was submitted to Genbank (Accession No. GQ223114) and thus represents a consensus sequence. The extracts also tested positive in RT-PCR with a second set of primers corresponding to sequences in TRV RNA-2 yielding a 3.8-kbp amplicon (1). No evidence was found by RT-PCR for several other viruses that cause tuber necrosis in potato (*Potato mop top virus*, *Tomato spotted wilt virus*, *Alfalfa mosaic virus*, and tuber necrosis strains of *Potato virus Y*). The virus was mechanically transmitted by inoculating sap from symptomatic tubers from both counties to tobacco cv. Samsun NN, which showed typical bright yellow patches and spots on leaves 2 weeks postinoculation. TRV was confirmed in tobacco by RT-PCR from total RNA extracted from tobacco leaves with both sets of the aforementioned primers. To our knowledge, this is the first report of TRV in North Dakota and the first report of corky ringspot disease of potato in this state.

References: (1) J. M. Crosslin et al. *Virus Res.* 96:99, 2003. (2) N. C. Gudmestad et al. *Plant Dis.* 92:1254, 2008. (3) D. J. Robinson. *J. Virol. Methods* 40:57, 1992.

Cited by

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