# Disease Note

## Diseases Caused by Viruses

### First Report of Lettuce Ring Necrosis Virus in Chili Pepper and Tomato in Belgium and the Netherlands

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Lettuce ring necrosis virus (LRNV), genus *Ophiovirus*, was detected by the Netherlands Institute for Vectors, Invasive plants and Plant health (NIVIP) in June and November of 2021 in two samples of chili pepper fruits (*Capsicum* spp.), both in mixed infection with other viruses. The first sample originated from a production site in Belgium (Sample ID: 40009704) and the second from a production site in the Netherlands (Sample ID: 41115269). One of the fruits of 40009704 showed a light purple circular pattern, while fruits from 41115269 showed colored (ring)spots. The samples were analyzed using Illumina sequencing on a NovaSeq 6000 platform (PE 150) (Illumina, San Diego, CA) as described previously (Hammond et al. 2021), obtaining 39.9M and 22.8M total reads for 40009704 and 41115269, respectively. The corresponding sequence read archives (SRA) were deposited in the NCBI SRA database under BioProject accession number PRJNA917231. From both samples, the nearly complete genome of LRNV (RNA1-4) was obtained and deposited in GenBank (40009704, OQ160823 to OQ160826 [7,616, 1,799, 1,502, and 1,382 nt; mapped reads: 40K, 12K, 114K, and 12K; average read coverage {ARC}: 0.8K, 0.9K, 11.3K, and 1.1K]; 41115269, OQ160827 to OQ160830 [7,616, 1,801, 1,518, and 1,389 nt; mapped reads: 112K, 7K, 357K, and 55K; ARC: 2.2K, 0.6K, 34K, and 5.8K]). The shared sequence identities with the GenBank reference sequence of LRNV (NC_006051 to NC_006054) were 99.2 and 99.2% (RNA1), 99.1 and 99.1% (RNA2), 98.3 and 98.8% (RNA3), and 99.0 and 98.9% (RNA4) for 40009704 and 41115269, respectively. The shared sequence identities between 40009704 and 41115269 were 99.9 (RNA1), 99.0 (RNA2), 99.1 (RNA3), and 99.5% (RNA4). In addition to LRNV, the ophiovirus ranunculus white mottle virus (RWMV) was detected in both samples (OQ160831 to OQ160834; OQ160835 to OQ160838), while the tobamovirus pepper mild mottle virus (PMMoV) was present in the fruits of 41115269 (OQ160839). Since RWMV has been associated with leaf symptoms in pepper (Gambley et al. 2019; Rivarez et al. 2022) and the colored (ring)spots of 41115269 were very similar to reported symptoms of PMMoV-infected pepper fruits (Martínez-Ochoa et al. 2003), it remains unclear whether LRNV contributed to the observed symptoms. Additionally, LRNV was detected in tomato (*Solanum lycopersicum*) in Belgium in 2020. In the frame of a metagenomic survey using virion-associated nucleic acids (VANA)-based protocol (Maclot et al. 2021) on a NextSeq 500 platform (PE 150), partial genome sequences of LRNV were detected in two pools of tomato plants. One pool was made of 44 asymptomatic cultivars from a noncommercial grower (one sample per cultivar) yielding 118K total reads of which 84, 59, 335, and 18 reads mapped on RNA1, 2, 3, and 4, covering 35, 69, 100, and 55% of the genome, respectively. The other pool consisted of 15 plants from one cultivar from a production site yielding 3.1M total reads of which 6 and 5 reads mapped on RNA3 and 4, respectively. The detection of LRNV was confirmed for both pooled samples using the real-time RT-PCR method, targeting the CP gene, as described by Maachi et al. (2021). To our knowledge, this is the first report of LRNV in pepper anywhere in the world. Additionally, although the disease lettuce ring necrosis in lettuce (*Lactuca sativa*) has been described in Belgium and the Netherlands before the causal agent was identified (Bos and Huijberts 1996), this is the first official report of this virus in Belgium and the Netherlands. This publication resulted from prepublication data sharing of sequences and biological data among plant virologists to provide more context to two independent findings (Hammond et al. 2021).

*References*:

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