



# First report of hippeastrum mosaic virus, narcissus late season yellows virus, narcissus latent virus and narcissus mosaic virus in daffodils from Hungary

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In the spring of 2018, all daffodil (*Narcissus* sp.) plants showed yellow-green streak mosaic symptoms on the leaves in a commercial nursery in Central Hungary suggesting virus infection. Leaf samples (5 each) were collected from each lot of the following cultivars: ‘Tête-à-Tête’ (lot 644) and ‘Dutch Master’ (lot 660, 661).

ACP-ELISA based on monoclonal PTY1 antibody (Jordan and Hammond 1991), (Agdia) was positive for all tested samples proving potyvirus infection.

For virus identification RNA was extracted from all collected samples and RT-PCR was carried out using universal potyvirus primers (Salamon and Palkovics 2005) and also with multiplex RT-PCR primers for detection of narcissus latent virus (NLV) and narcissus mosaic virus (NMV) (He et al. 2019). From each daffodil sample similar sized PCR products were cloned into pGEM®-T Easy vector followed by nucleotide (nt) sequence determination, which resulted in identification of NLV (GenBank accession No. MN068007) and hippeastrum mosaic virus (HiMV)

(MK132192) in cultivar ‘Tête-à-Tête’. The determined HiMV nt sequence showed 93% identity with HiMV (JN135235) isolates collected from a hippeastrum cultivar in India. The NLV sequence shared 99% identity with NLV from Japan (LC158509). Sequencing of PCR products from cultivar ‘Dutch Master’ revealed infection with three different viruses: narcissus late season yellows virus (NLSYV) (MK132193), NLV (MN068008) and NMV (MN068009). The NLSYV nt sequences showed the highest identity (99%) with a recently described Japanese isolate of NLSYV (LC158467). The NLV and NMV fragments showed 98% and 97% identity with isolates from Japan (LC158508) and New Zealand (AY225449), respectively.

The presence of these viruses in the tested daffodil leaf samples were confirmed by dot-blot hybridization using the cloned PCR products as probes. The dot-blot assay verified the presence of HiMV and NLV in samples from batch No. 644, and NLSYV, NMV and NLV in the samples from batches No. 660 and 661.

To our knowledge this is the first report of HiMV, NLSYV, NMV and NLV from Hungary and also the first report of HiMV infection on narcissus.

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