

First finding of soil-borne cereal mosaic virus (SBCMV) infecting wheat in Slovenia

Irena Mavrič Pleško, Barbara Grubar, Marjetica Urbančič Zemljič, Janja Lamovšek, Eva Kovačec

Agricultural Institute of Slovenia, Hacquetova ulica 17, SI-1000 Ljubljana, Slovenia

The presence of soil-borne cereal viruses in Slovenia is understudied, therefore we conducted a small survey as part of Euphresco project Cerevir (2021-A-374). Barley (*Hordeum vulgare*) and wheat (*Triticum aestivum*) samples showing virus-like symptoms were collected in the years 2022 to 2024 in central and north-eastern Slovenia. The observed symptoms included yellow streaks and mosaic patterns, yellowing or reddening of the leaf tips. All collected samples were tested by double antibody sandwich ELISA (DAS-ELISA) for barley and cereal yellow dwarf viruses (BYDVs and CYDVs), wheat dwarf virus (WDV), barley mild mosaic virus (BaMMV), barley yellow mosaic virus (BaYMV), soil-borne cereal mosaic virus (SBCMV), soil-borne wheat mosaic virus (SBWMV), wheat spindle streak mosaic virus (WSSMV), barley stripe mosaic virus (BSMV) and wheat streak mosaic virus (WSMV), according to manufacturer's instructions (DSMZ/Bioreba). From 70 samples collected during the study period, three wheat samples from central Slovenia tested positive for SBCMV. Other viruses sporadically detected in tested samples were BYDVs, CYDVs and WDV. To confirm the DAS-ELISA results for SBCMV, total RNA was extracted from all samples using MagMAX-96 Total RNA Isolation Kit supplemented with Plant RNA Isolation Aid (both by Thermo Fischer Scientific) and reverse transcribed using High-Capacity cDNA Reverse Transcription Kit (Thermo Fischer Scientific) according to manufacturer's instructions. SBCMV was detected using qPCR described by Marra et al. (2023). Only the three DAS-ELISA-positive samples were confirmed to be positive by this method. SBCMV was shown to cause significant yield losses by up to 50% in susceptible winter wheat cultivars (Clover et al. 1999) and even by 70% when infecting durum wheat (Vallega and Rubies Autonell 1985). It was already identified in wheat, rye and their hybrid triticale, and reported from different countries, including UK, France, Germany, Denmark, Italy and Poland (Budge et al. 2008). The results indicate low abundance of the virus in Slovenian production fields. To the best of our knowledge, this is the first report of SBCMV detection in cereals in Slovenia. *Polymyxa graminis* vector of SBCMV is widespread in Europe (Kanyuka et al. 2003); however there are no records of its presence in Slovenia. Further studies on the presence and distribution of *P. graminis* in Slovenia are needed to evaluate the importance of this finding for Slovenian wheat production.

References:

Budge, G. E., et al. 2008. Eur. J. Plant Pathol. 120:259. <https://doi.org/10.1007/s10658-007-9214-9>.

Clover, G. R. G., et al. 1999. Page 105 in: Proceedings of the Fourth Symposium of the International Working Group on Plant Viruses with Fungal Vectors. J. L. Sherwood and Rush C. M., eds. American Society of Sugar Beet Technologists, Monterey, California, U.S.A.

Kanyuka, K., et al. 2003. Mol. Plant Pathol. 4(5):393. <https://doi.org/10.1046/j.1364-3703.2003.00177.x>.

Marra, M., et al. 2023. *Viruses*. 15(1):140. <https://doi.org/10.3390/v15010140>.

Vallega, V., and Rubies Autonell, C. 1985. *Plant Dis.* 69:64. <https://doi.org/10.1094/PD-69-64>.

Funding: The work was funded by the Ministry of Agriculture, Forestry and Food; and the Slovenian Research and Innovation Agency (research programs P4-0072 and P4-0431).