

# Plant pathology research at the Taras Shevchenko National University of Kyiv

Oleksiy Shevchenko<sup>1</sup>, Irena Budzanivska<sup>1</sup>, Larysa Skivka<sup>2</sup>, Natalia Taran<sup>3</sup>, Tetiana Shevchenko<sup>1</sup>

<sup>1</sup>Taras Shevchenko National University of Kyiv, Department of Virology, 64/13, Volodymyrska Street, City of Kyiv, Ukraine, 01601

<sup>2</sup>Taras Shevchenko National University of Kyiv, Department of Microbiology and Immunology, 64/13, Volodymyrska Street, City of Kyiv, Ukraine, 01601

<sup>3</sup>Taras Shevchenko National University of Kyiv, Department of Plant Biology, 64/13, Volodymyrska Street, City of Kyiv, Ukraine, 01601

e-mail: [alexshevchenko@ukr.net](mailto:alexshevchenko@ukr.net)

Here we describe major directions of plant pathology research at the biggest university of Ukraine, Taras Shevchenko National University of Kyiv. Mainly, phytopathology studies are conducted at three neighboring departments: Virology, Microbiology and Immunology, and Plant Biology. Every department is famous for its unique research but there are quite a few common aspects joining us together and making the outcomes solid in the context of plant diseases. Most of the aspects of our research are defined by the widely cultivated plant cultures and/or current issues of their pathology (viruses, microbes or abiotic stresses).

Further, the main aspects of our research are listed and will be discussed during the talk: diagnostics and study of viruses of the main crops cultivated in Ukraine, influence of viruses on crop yield and content of biologically active substances, virus-induced physiological and biochemical changes in plants, variability of plant viruses under climate change, molecular epidemiology and evolution of plant viruses, development of strategies to control the spread of plant virus infections, development of test systems for plant virus diagnostics, complex analysis of bacteriophages of phytopathogenic bacteria, investigation of endophytic microbial communities in a search for candidates for the development of plant protection products, elucidation of the adaptive reactions of plants to pathogens and its exogenous regulation by biotic and abiotic effectors, use of biocidal metal nanoparticles as stress-modeling effects of pathosystems, and pre-screening of regulatory systems of different plant genotypes during infection.

## References:

1. Kawakubo S, Gao F, Li S et al. (2021) Genomic analysis of the brassica pathogen turnip mosaic potyvirus reveals its spread along the former trade routes of the Silk Road. PNAS, 118(12) e2021221118.
2. Holovan V, Andriichuk O, Budzanivska I et al. (2021) Bacteriophages and their microbial hosts in terrestrial biotopes of Antarctica. Antarctic Science, 1-17.
3. Mishchenko L, Nazarov T, Dunich A, et al. (2021) Impact of wheat streak mosaic virus on peroxisome proliferation, redox reactions, and resistance responses in wheat. IJMS, 22(19): 10218.
4. Pastoshchuk A, Yumyna Y, Zelena P, et al. (2021) Beneficial traits of grain-resided endophytic communities in wheat with different sensitivity to *Pseudomonas syringae*. Regul Mech, 12(3): 498-505.
5. Zlatohurska, M, Gorb, T, Romaniuk, L, et al. Complete genome sequence analysis of temperate *Erwinia* bacteriophages 49 and 59. J Basic Microbiol. 2019; 59: 754–764.