



Review of the Ph.D. Thesis

Riaba I. A. Molecular and biological characterization of raspberry and blackberry viruses and their occurrence in Polissya and Forest-Steppe of Ukraine.

Dissertation for the degree of Doctor of Philosophy in speciality 203 Horticultrae, Vegetable Growing, and Viticulture

Institute of Horticulture, NAAS, Kyiv, 2025

The dissertation by Iryna A. Riaba, “Molecular and biological characterization of raspberry and blackberry viruses and their occurrence in Polissya and Forest-Steppe of Ukraine,” represents a comprehensive study dealing with an important and timely topic in horticultural virology. The work focuses on the identification, molecular characterization, and practical implications of viruses affecting raspberry and blackberry crops in Ukraine, two economically valuable berry species whose productivity is strongly dependent on their phytosanitary status.

Research results and regulatory implications

The research is clearly structured, and the individual parts of the thesis form a logical whole, leading from field observations and laboratory diagnostics to practical conclusions and recommendations. The dissertation begins with a well-prepared theoretical background that summarizes current knowledge about *Rubus*-infecting viruses and the main global and regional challenges related to their control. The author demonstrates a good grasp of the international context, including references to EPPO certification schemes and relevant European standards. The formulation of research objectives is precise and corresponds well to the needs of Ukrainian horticulture, where systematic phytovirological monitoring of raspberry and blackberry has been largely absent until now. From a formal and scientific point of view, the dissertation meets the requirements for a PhD thesis. The text is written in a clear and comprehensible style, supported by adequate tables and figures that illustrate the results effectively. The research methods are standard for this scientific area and are applied correctly. The author’s conclusions are supported by the obtained data, and the overall tone of the thesis remains balanced and objective.

The experimental work combines several methodological approaches—ELISA, RT-PCR, sequencing, and phylogenetic analysis—applied to samples collected across ten Ukrainian regions. This broad geographic coverage strengthens the reliability of the results and allows for meaningful comparisons between areas. The detection of seven viruses and one phytoplasma, including the first record of Raspberry bushy dwarf virus (RBDV) in blackberry and Raspberry vein chlorosis virus (RVCV) in raspberry, represents an important contribution to the national plant protection database. The molecular and genetic characterization of the identified isolates, particularly the analysis of RBDV and RLBV coat protein sequences, was performed correctly, and the inclusion of the obtained data in the NCBI GenBank adds value for future comparative research. The section on the use of antiviral



VÝZKUMNÝ A ŠLECHTITELSKÝ ÚSTAV OVOCNÁŘSKÝ HOLOVOUSY s. r. o.

Research and Breeding Institute of Pomology Holovousy Ltd.

compounds for virus elimination in vitro presents interesting findings. The selection of substances—acyclovir, oseltamivir, rimantadine, and ribavirin—shows an effort to explore less conventional agents for plant virus control. The observed differences in phytotoxicity and efficiency are well documented, although further experiments with larger sample sizes and more replicates would help to confirm the consistency of the results. Nevertheless, the idea of using these compounds as supportive tools for producing virus-free propagation material is noteworthy and practically relevant for nursery production systems.

Another strong aspect of the work lies in linking virological data with physiological and agronomic outcomes. The assessment of the impact of RBDV infection on water relations, chlorophyll content, photosynthetic activity, and fruit quality across several raspberry cultivars is detailed and informative. These findings convincingly demonstrate that viral infection not only reduces yield but also alters fruit composition and commercial value. The accompanying economic evaluation of productivity losses gives the study an applied dimension and underlines the need for preventive measures in the certification of planting material. The discussion and conclusions are generally well reasoned, although in some parts they could be expanded with a deeper comparison to similar studies from neighboring regions or to European data. The author's proposals for updating Ukrainian certification standards in accordance with EPPO guidelines are justified and show awareness of the broader regulatory framework.

Conclusions and overall assessment:

In summary, Iryna A. Riaba's dissertation provides a valuable contribution to understanding the distribution and characteristics of *Rubus* viruses in Ukraine. It combines careful laboratory work with practical recommendations that can contribute to improving the health and productivity of raspberry and blackberry plantations. Although the research does not introduce entirely new methodologies, it successfully applies modern virological techniques to a problem of significant national importance. The work demonstrates solid professional competence, critical thinking, and the ability to link scientific findings with agricultural practice. For these reasons, the dissertation can be assessed positively and is suitable for recommendation for the award of the PhD degree in Horticulture, Vegetable Growing, and Viticulture.

I give the thesis positive evaluation and recommend the work for defense.

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VÝZKUMNÝ A ŠLECHTITELSKÝ ÚSTAV
OVOCNÁŘSKÝ HOLOVOUSY s.r.o.
Holovousy čp. 129
508 01 HOLOVOUSY
DIČ: CZ25271121 ①
ZÁPIS U KRAJSKÉHO SOUDU V HRADCI KRÁLOVÉ - ODDÍL C,
VLOŽKA 11778
Ing. Jiří Sedlák, Ph.D.