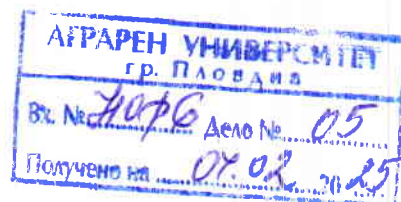


OPINION



Regarding a dissertation work for obtaining the educational and scientific degree of "Doctor" in the field of higher education: **6. Agrarian Sciences and Veterinary Medicine**, professional area: **6.2. Plant protection (Phytopathology)**, scientific specialty: **Plant Protection**.

Author of the dissertation work: **MARTIN GEORGIEV MARINOV**, a full-time doctoral student at the Phytopathology Department of the Agricultural University – Plovdiv.

Title of the dissertation work: Epidemiology and control of white rust in cherry and sour cherry trees (*Blumeriella jaapii*).

Reviewer: **Prof. PETAR NIKOLOV CHEVDAROV, PhD**, Konstantin Malkov Institute for Plant Genetic Resources – Sadovo, professional area: 6.2. Plant Protection, scientific specialty: Plant Protection, assigned a member of the scientific jury according to Order № **РД-16-1330/22.11.2024** of the Rector of the Agricultural University – Plovdiv.

1. Relevance of the research study

The fruit tree species cherry (*Prunus avium* L.) and sour cherry (*Prunus cerasus* L.) are widely distributed in countries with a temperate continental climate. The sustainable development of the industry is due to the early beginning of fruiting phase of plantations, the relatively low costs during their exploitation and the quick return on investment. Pest control is of crucial importance for achieving high yields and quality of production. White rust (*Blumeriella jaapii* (Rehm) Arx) is among the most common fungal diseases in cherry and sour cherry worldwide. As a result of the long-term use of systemic fungicides, new resistant races of the pathogen have emerged, which poses a serious risk to the development of the sector in some regions of the world. In this regard, the presented topic of the dissertation is relevant and has a practical focus.

2. Aim, tasks, hypotheses and methods of research

The aim of the research is clearly formulated, and the presented tasks lead to its achievement. All studies were conducted at a modern scientific and methodological level. The symptoms of White rust in cherry and sour cherry were studied, as well as the cultural and morphological features of the pathogen. The dynamics of ascospores release and spring microconidia were monitored. A study was carried out on the development of apothecia and spring acervuli under laboratory conditions. The development of White rust was monitored during the season, the dynamics of leaf decomposition after leaf fall was recorded.

3. Visualization and interpretation of the obtained results. References

The dissertation has a total volume of 184 pages. It is properly structured and contains all the necessary sections - introduction, literature review, aim and objectives, materials and methods, results and discussion, conclusions, contributions, references and applications. The obtained results are illustrated with 51 figures and 38 tables. They are presented on 94 pages and follow the sequence of the tasks set. The obtained data are based on a sufficient number of experiments and are correctly interpreted. The reference list includes a total of 310 sources, of which 43 in Cyrillic and 267 in Latin. All this shows the excellent awareness of the candidate on the research problem.

4. Contributions

The original, scientific and applied contributions presented in the dissertation are real and proven in the course of the research. I accept all of them and consider them to be the personal work of the candidate. I allow myself to quote the most important of them:

4.1 Original scientific contributions

- ▶ For the first time in the world, a precise (hourly) study of the amount of spores in air was conducted using a high-class 7-day spore trap such as that of Burkard Manufacturing Co Ltd.
- ▶ For the first time in the world a differentiated recording of the amount of ascospores and spring microconidia in air was conducted, thus allowing the determining of their ratio and dynamics of dispersion during the day and the growing season.
- ▶ For the first time in Europe a study was conducted to prove infectious events under field conditions using control plants.
- ▶ Spring microconidia dispersion is possible at any time of the day and does not depend on light.
- ▶ After a laboratory study the necessary amount of degree-days for the maturation of fruiting bodies apothecia and spring acervuli was calculated.
- ▶ For the first time in the world a study was conducted to use a predictive model of Eismann and Jones with a built-in weather forecast, which allows a more flexible approach to decision-making and conducting preventive, not just curative, treatments.

4.2 Supporting scientific contributions

- ▶ In the conditions of Bulgaria, the disease also develops symptoms on cherry stalks.
- ▶ Dispersal of ascospores in the causative agent of White rust is possible at any time of the day.
- ▶ In most years, the amount of ascospores in white rust is greater than that of spring microconidia, but it is possible that they are in equal amounts.

4.3 Applied contributions

- ▶ Epidemiological data on airborne ascospores and spring microconidia may be used to create a mathematical model that could be part of risk assessment of the primary infection.
- ▶ Data on the dynamics of decomposition in fallen leaves may be used as a component of a predictive model for primary white rust infection.

► Chemical treatments during flowering and thereafter, aimed at preventing infection on the stipules, are essential for the control throughout the season. During flowering ascospores and spring microconidia have been identified.

► Confirmed infection on fruit stalks may become an additional infectious factor in orchards where production is harvested mechanically and stalks remain on the trees until spring.

► The main stock of primary inoculum is realized by the end of May, but some of it dissipates by the end of June. This proves the need for preventive spraying even during the harvest period and emphasizes the importance of all sanitary measures beforehand that would reduce the infectious pressure.

5. Evaluations of scientific publication and their quality

The candidate presents one scientific publication related to the dissertation work published in *Agrarian Sciences* journal in 2022. He also participated in two scientific conferences in Bulgaria and the Republic of Serbia in 2019. The presented abstract objectively reflects the structure and content of the dissertation work and is excellently structured. It is illustrated with 23 figures and 28 tables.

6. Critical notes, questions and recommendations

I have no critical notes regarding the submitted dissertation work.

CONCLUSION

Based on the various research methods learned and applied by the doctoral student, the correctly conducted experiments, the generalizations and conclusions made, I believe that the presented dissertation meets the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations of the Agricultural University for its application, which gives me reason to evaluate it **POSITIVELY**.

I would like to propose the esteemed Scientific Jury to also vote positively and to award **Martin Georgiev Marinov** the educational and scientific degree of "doctor" in the professional area **6.2 Plant Protection (Phytopathology)**, scientific specialty: Plant Protection.

27th January 2025
The town of Sadovo

REVIEWER:

/Prof. Petar Chavdarov, PhD/