

STATEMENT

by Prof. Hristo Najdenski, Department of Infectious Microbiology, Institute of Microbiology, "Stephan Angeloff" at the Bulgarian Academy of Sciences (BAS) on a PhD thesis submitted for defense before a Scientific Jury, formed by order No. 35/11.04.2024 of the Director of Institute of Biodiversity and Ecosystem Research (IBER-BAS) for obtaining the educational and scientific degree "Doctor" by field of higher education: code 4. "Natural sciences, mathematics and informatics"; Professional direction: cipher 4.3. "Biological Sciences"; Scientific specialty: "Botany"

Author of the PhD thesis: land. arch. Vladimir Metodiev Ilinkin

Title: "Biotechnological approach to cultivation of *Tanacetum cinerariifolium* (Trevir.) Sch. Beep. (Asteraceae)'.

Since ancient times, mankind has used plants for various purposes, and the empirical knowledge accumulated over the centuries about the healing and other useful properties of wild plants logically became the object of intensive research. New biologically active substances are constantly being discovered, the majority of which are secondary metabolites, which not only find a variety of applications in human life, but also increasingly meet his growing requirements for harmlessness, efficiency, biodegradability, etc. One of the research directions is the search among the secondary metabolites of contact insecticides that have repellent and/or insecticidal action. It is known that there are a large number of insect enemies of plants, animals and humans, which are a serious problem for mankind, destroying a significant part of agricultural production, carrying and spreading a number of infectious diseases to humans and animals, etc. That is why the search for harmless and effective insecticides continues to be a topical issue in the current century. This is precisely where land. arch. Vladimir Ilinkin's research is directed, who aims to experimentally determine the optimal conditions for the propagation of *Tanacetum cinerariifolium* (Trevir.) Sch Bip, using a number of modern plant biotechnologies and selecting promising in vitro clones for future testing in agroculture. For the fulfillment of this goal, the author sets himself seven tasks to perform, including the application of a number of classical and modern methods.

His work as a PhD student at IBER-BAS (2016-2019), as Head of the "Central University Laboratory of Ecology and Protection of the Natural Environment" at LTU and Head of the "Central Laboratory for Agrochemical Analyzes" at the Institute of Soil Science, Agrotechnologies and plant protection "N. Pushkarov", as well as his specialization at the University of Zagreb (Croatia) contribute a lot, both to the acquisition of new knowledge and competences, and to their skillful application in the advocated scientific fields in his PhD thesis.

The format of this thesis includes the sections "Introduction", "Aim and Tasks" and "Literary Review" with 156 up-to-date literary sources in Bulgarian and English languages. The sections "Materials and Methods", "Results" and "Discussion" have been replaced with copies of 4 publications on the topic of the PhD thesis, which is permissible according to Art. 9 of the "Regulations on the terms and conditions for acquiring scientific degrees and holding academic positions at the Institute of Biodiversity and Ecosystem Research at the BAS" when presenting the PhD thesis in the form of bound scientific publications. The presented publications are printed in international journals and cover the entire content of the PhD thesis. The conclusions in the articles, as well as the conclusions and contributions in the PhD thesis, fully reflect the content and the results achieved. Task №6 was also successfully completed to create a laboratory protocol for effective in vitro micropropagation of *Tanacetum sinerariifolium*, which also provides practical opportunities for future development and research of this plant species in agricultural crops. The plant material, soil samples and the number of repetitions used in the experiments are representative of the relevant analyzes and allow reliable results and objective conclusions to be obtained.

Important results were obtained for viability and germination under in vivo (in petri dishes and on different soil types) and in vitro conditions, using seeds from an ex situ collection in Bulgaria, as well as seeds from a natural population in Croatia. Of great practical importance are the results regarding the bacteriostatic effect of an antibiotic included in the media at different concentrations on endophytic microorganisms in long-term in vitro cultures, as well as the modified basic nutrient medium with the addition of a corresponding concentration of calcium in it. Original results were also obtained regarding the composition and content of pyrethrins in ponies germinated on different soil types from Bulgaria, comparing the content of pyrethrins in flower baskets from the primary and

secondary flowering of clonally propagated and acclimatized plants from an ex situ collection.

The presented conclusions and contributions correspond to the obtained results and emphasize the scale of the research and its applied relevance.

Conclusion

The presented PhD thesis is undoubtedly up-to-date and of high scientific and scientific-applied value. It clearly shows the very good theoretical and professional training of the PhD student, as well as his skills for independent research work. A wide range of modern biotechnological and analytical methods have been mastered, and results and contributions important for science and practice have been obtained, which are visible to the scientific community in Bulgaria and abroad. I believe that the PhD thesis meets all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for its Implementation and the Regulations for the Implementation of the LDASRB of the Bulgarian Academy of Sciences, as well as the specific requirements of the IBER-BAS Regulations for the Application of LDASRB.

In view of the above, I confidently propose to the honorable Scientific Jury to award the educational and scientific degree "Doctor" to land. arch. Vladimir Ilinkin in the field of higher education: 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological Sciences, scientific specialty Botany.

13.05.2024 r.

Prof. Hristo Najdenski