

STATEMENT

Of a PhD thesis for the awarding the educational and scientific degree “Doctor”, field of higher education 6.0 Agricultural sciences and veterinary medicine, professional field 6.4 Veterinary medicine, in the scientific speciality “Epizootology, infectious diseases and prevention of contagious diseases in animals”

Author of the PhD thesis: **Toshka Evgenieva Petrova**, PhD student in Faculty of Veterinary medicine, University of Forestry

Title of the PhD thesis: “**Antimicrobial action and biological effects of electrochemically activated water solutions**”

Member of the scientific jury: **Assoc. Prof. Iliyan Manev Manev, DVM, PhD**, scientific speciality “Epizootology, infectious diseases and prevention of contagious diseases in animals”, Faculty of Veterinary medicine, University of Forestry, according to Order ЗПЦ-370/5.07.2023 of the Rector of University of Forestry.

Brief introduction of the candidate

Toshka Evgenieva Petrova is a master in Veterinary medicine, graduated in 2007 in University of Forestry with total mark: Very good 5.42. In the period between January 2008 and December 2016 she occupied the position of Assist. Prof. in the Faculty of Veterinary medicine, in the disciplines of Forensic Veterinary Medicine and Public Veterinary Case and Legislation. From January 2017 is an Assist. Prof. in Microbiology. Toshka Petrova is enrolled as PhD student in University of Forestry (Order of the Rector ЗСД-21/24.01.2020) with scientific supervisor Prof. Teodora Petrova Popova, DVM, DSc. She completed the individual study plan and was awarded the right to defend the PhD thesis (Order ЗСД-128/24.4.2023).

Relevance of the topic

Research on innovative agents with effective antimicrobial effects is a particularly urgent scientific and applied task, especially in the context of increasingly widespread antimicrobial resistance and polyresistance of major pathogenic and opportunistic microorganisms, both to a number of antibiotics and to widely used in clinical and laboratory practice disinfectants. Electrochemically activated aqueous solutions combine a good antimicrobial effect with low toxicity and side effects, as well as an acceptable price. No less important are the potential biologically active properties of catholyte as a means of reducing the effects of free radicals and improving the microbiome environment in the body.

Literary awareness

The literature review is written on 47 standard pages and is based on 348 scientific sources. A comprehensive characterization of electrochemically activated aqueous solutions has been made, both in the historical context of their development of use, as well as their preparation and possible ways of application in clinical and laboratory practice. The text is written in academic and at the same time understandable language, which allows it to be used by a wide range of medical professionals.

Purpose, tasks and research methods

Until now, complex studies on the antimicrobial action and the main biological effects of electroactivated aqueous solutions have not been carried out in our country. On this basis, I can conclude that the chosen purpose of the study is relevant, modern and significant for medicine. For the realization of this goal, five tasks have been formulated. They include both *in vitro* studies (classical laboratory methods from bacteriology) aiming to prove the antimicrobial effects of these solutions in different contexts, as well as to describe possible biological effects *in vivo*. The study also includes a certain number of clinical cases of therapy of various bacterial and mycotic infections of the skin and mucous membranes with the investigated aqueous solutions. Where possible, statistical analysis was applied to demonstrate the reliability of the results obtained.

Results

The section contains a sufficient amount of factual material, which is presented sequentially, based on the individual tasks, and is written in 65 pages. The results are presented in 37 tables and illustrated with 58 figures. Based on the obtained results, 9 conclusions were postulated.

Contributions and recommendations

The PhD student has formulated 12 original contributions. Based on the received data, 5 recommendations for practice were made. Four scientific articles in English on the topic of the dissertation are published, all four of which are in refereed and indexed in Web of Science scientific journals. Dr. Petrova is the first author on three of the publications, which is usually an indication of her lead role in writing them. The total number of points from the presented publications is 33.5, which covers the minimum national requirements and the Regulations of the LTU for its application. No data is presented on established citations of the mentioned publications.

Abstract

The presented abstract of the PhD thesis poses 50 pages. It is prepared according to the requirements and reflects the main results achieved in the dissertation.

Critical remarks and questions

I have no significant critical remarks to the final version of the presented dissertation. Most of the previous features and technical errors have been fixed. My only substantive comment is on the selection of clinical patients which are included in the study. They are a heterogeneous group of patients with superficial infections of the skin, external ear and conjunctiva, and in some of the animals it is a matter of chronic processes, with unknown co-morbidities and factors. This brings to me some uncertainty for more serious medical conclusions in the interpretation of these clinical cases.

Conclusion

The presented PhD thesis on the topic: "Antimicrobial activity and biological effects of electrochemically activated aqueous solutions" represents a complex and thorough study and

contains sufficient contributions. Various scientific studies have been carried out, a large number of results have been obtained, some of which have been popularized in English in refereed scientific journals. It is also important to note the indisputable personal involvement of the doctoral student. All national legislative requirements and the Regulations of the University of Forestry for its application have been fulfilled. All this gives me reason to vote POSITIVE. I also can recommend to the scientific jury also to vote positively and award to master Toshka Evgenieva Petrova, the educational and scientific degree "doctor" in the scientific specialty "Epizootology, infectious diseases and prevention of contagious diseases in animals".

Statement prepared by:



Assoc. Prof. Iliyan Manev, DVM, PhD

Sofia, 05.10.2023