

## OPINION



for the acquisition of an educational and scientific degree "doctor"

The review was prepared on the basis of order No. ZLS-567 dated 14.11.2023 of the rector of LTU, Sofia for approval of the composition of a scientific jury.

**Reviewer:** Prof. Dr. Hristo Yordanov Daskalov, NDNIVMI, Sofia

**Author of the dissertation:** Master of Veterinary Medicine Radoslav Mitkov Rafailov

**Topic of the dissertation:** "STUDY ON CARDIAC DIROFILARIOSIS IN DOGS IN BULGARIA".

The dissertation has been submitted for the acquisition of the Educational and Scientific Degree "Doctor" in the scientific specialty "Parasitology and Invasive Diseases of Animals and Humans", field of higher education 6.0 Agricultural Sciences and Veterinary Medicine, professional direction 6.4. Veterinary Medicine

Dr. Radoslav Rafailov was born on 07/02/1990 in the city of Lovech, Bulgaria. He completed his secondary education at a natural and mathematical high school profile "Biology and health education with the study of the English language" in his hometown. He graduated his higher education in veterinary medicine with the degree "Master of Veterinary Medicine" at the Forestry University, Sofia Faculty of Veterinary Medicine in 2015. During the period 2016 - 2020, he worked as an assistant professor in FVM at LTU Sofia. He has experience as a practicing veterinarian at St. George Veterinary Clinic, Estrella Vet OOD, Sofia.

### I. General presentation of the dissertation work

The dissertation consists of 187 pages of standard typewritten text. It has Introduction – 2 p., Literature review – 33 p., Own research (aim and objectives – 1 p.; material and methods – 19 p.; results – 66 p.; discussion – 19 p.; conclusions – 2 p. ; recommendations for practice – 1 page; reference for the contributions of the dissertation – 1 page; participation in scientific conferences, publications in connection with the dissertation work and citations – 2 pages, acknowledgments 2 pages and used literature – 33 pages. The dissertation contains 13 tables and 105 figures. The list of literary sources consists of 393 titles in Latin - 331 and Cyrillic - 62.

The formulated goal of the dissertation work is directly related to the study of the prevalence of cardiac heartworm disease in dogs in different regions of Bulgaria, as well as to specify the possibilities for diagnosing the disease. New facts are added about the pathological changes in the final hosts, the species composition of the intermediate hosts, the seasonal dynamics of mosquitoes in different areas of the country, and a correlation is made between their number and their carriage of *D. immitis microfilariae*. The tasks set for implementation are directly related to the formulated goal. The main tasks are studies of the prevalence of *D. immitis* in dogs in different regions in Bulgaria by using rapid antigen

tests. Comparing the results of different diagnostic methods. Determining the species composition of mosquitoes in the different regions of the country and their carrier in relation to the parasite. The dynamics of mosquito infection with the parasite, as well as determination of their carriage in different cities of the country. Confirmation of the severity of invasion by pathological and histological findings in the internal organs of dogs with proven cardiac heart dirofilariasis.

## **II. Assessment of the form and content of the dissertation**

Trial performances are directly related to the implementation of the intended goal and set tasks. Routine and modern laboratory methods were used to process the materials and the results obtained are beyond doubt. The studies can claim national representativeness because the samples were taken from 01/01/2017 to 06/30/2021 and 2,626 dogs from 10 cities in Bulgaria were studied - Asenovgrad, Burgas, Vidin, Gotse Delchev, Dobrich, Lovech, Plovdiv, Ruse, Svishtov and Sofia, including both domestic animals (apartments and houses) and stray dogs. 43 dog breeds were included in the study, and one group of mixed breed dogs was also formed.

The obtained research results characterize the dissertation work as possessing the necessary qualities of scientific development for obtaining the educational and scientific degree "doctor", as well as full correspondence between the topic, purpose, tasks and factual content. The general impression of the dissertation work testifies to the clarity of the statements in the boundaries of the clearly formulated subject and object, purpose, tasks and hypotheses in the context of the dissertation topic. The dissertation and the conclusions drawn rest on comprehensive specialized national and foreign literature and factual information. The layout of the dissertation is very good, as the quality of illustration, figures and tabular material and justification of the research results. My overall assessment of the work presented is that it is the result of conscientious work and competent execution in the use of the information obtained, professional language and style of formulation of the statements, with a distinction of the contribution of the author of the study. 2 publications have been presented in a refereed scientific journal, which in terms of volume and thematic focus meet the requirements for obtaining the educational and scientific degree "doctor". 2 participations in scientific conferences have been presented. The presented scientific publications have been cited 3 times in international scientific journals. The articles are directly related to the problematic of the defended hypotheses, goals and tasks, and represent a successful attempt at research activity. It should be noted the fact that Dr. Rafailov is the lead in 1 or an independent author in the second presented publication. The abstract is presented in the established form and content It summarizes the main results of the research and gives the necessary insight into the theoretical and applied achievements of the author.

## **III. Scientific and scientific-applied contributions of the dissertation work**

The dissertation outlines clear scientific contributions with the potential for an applied effect in controlling the spread of cardiac heartworm disease by regions in Bulgaria, as the types of mosquito vectors and the dependence between their spread and temperature and

seasonal characteristics have been established. The effectiveness of applying Real time PCR to establish the presence of *D. immitis* microfilariae in mosquitoes from our country has been proven. The species of mosquitoes (*Ae. albopictus*, *C. pipiens*, *Ae. cinereus*, *Ae. vexans* and *Anopheles maculipennis* complex) in which microfilariae from the *D. Immitis* parasite are found have been determined. The current period of effective mosquito infestation during the summer months in nine cities of the country has been proven. The screening conducted for the presence of antigen from the parasite in dogs confirms the presence of the species *D. immitis* in the designated six regions of the country. Mosquitoes of the genera *Culex*, *Anopheles* and *Aedes* have been shown to be the most important as intermediate hosts and carriers of *D. immitis*.

#### **IV. Dissertation critical notes, questions and recommendations**

The dissertation covers all current issues related to this canine parasitosis. The doctoral student demonstrates with the written work a very broad professional culture in this matter. In big cities like our capital Sofia, there are tens of thousands of dogs and protecting them from this disease is more than relevant. Does the PhD student feel ready to practically assist the municipal leadership of the city so that the problem is minimized?

#### **V. Evaluation of the candidate's personal contribution**

A careful reading of the presented documents shows that Dr. Rafailov is the main driver in all stages of the conduct of scientific research and the presentation of scientific results at scientific forums and the preparation of articles for publication.

#### **VI. Personal impressions**

I do not know Dr. Radoslav Rafailov. The documents submitted to me for the preparation of the opinion helped me to form a good opinion of him in absentia. The dissertation is written extremely competently and excellently designed. The quality of the graphs, tables and the almost complete absence of technical errors and inaccuracies characterize him as a thorough and precise researcher. I wish him not to quickly build false self-confidence, but to move forward in his scientific pursuits.

#### **VII. Summary conclusion and opinion**

The overall research activity on the dissertation presented for consideration by Dr. Radoslav Rafailov shows that it meets the new high requirements related to the change that occurred in the law on the development of the academic staff in the Republic of Bulgaria. The presented voluminous work of data and their skillful interpretation, reflected in the dissertation work, supported by a sufficient number of published scientific works, participation in scientific forums confirms the fact that we have in the person of Dr. Rafailov a young and purposeful researcher with proven qualities in the field of veterinary medicine parasitology. The quality of scientific production is good, and this is confirmed by the publication of scientific articles in a refereed journal and open citations. The PhD student has dared to venture into an area with many challenges, such as parasitology and

heartworm disease in particular. Against the background of the new realities in the veterinary profession, this is a very prudent move.

**Everything written above gives me full reason to give a positive assessment and to propose to the Respected Scientific Jury to vote positively for Dr. Radoslav Rafailov to receive the educational and scientific degree "Doctor" in the scientific specialty "Parasitology and Invasive Diseases of Animals and Humans" , professional direction 6.4. Veterinary medicine, field of higher education 6. "Agrarian sciences and veterinary medicine".**

01/08/2024

Sofia

Reviewer's signature:

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(Prof. Dr. Hr. Daskalov, PhD)