

## **OPINION**

**By Associate Professor Iskra Georgieva Raynova, PhD,**

**National Center for Infectious and Parasitic Diseases (NCSPD)**

**Subject:** Dissertation thesis for the award of the educational and scientific degree

**'DOCTOR'**

**professional field:** 4.3. Biological Sciences

**doctoral program:** "Parasitology and helminthology"

**Author:** Dr. Iskren Tzvetkov Kaftandjiev

**PhD form:** self-study

**Department:** Parasitology and Tropical Medicine, NCIPD

**Topic:** "Characteristics of imports and assessment of the possibility of malaria recovery in Bulgaria in the face of global climate change"

**Scientific adviser:** Assoc. Prof. Dr. Rumen Nenkov Harizanov

### **1. General presentation of the procedure and the doctoral student**

The presented set of materials on paper and electronic media is in accordance with Art. 31 (2) of the regulation for the application of the ZRARB in the NCIPD and includes all required documents.

The preparation and arrangement of the necessary documents is correct and precise. In addition to his dissertation and his abstract, Dr. Kaftandjiev has enclosed a list of 29 publications in scientific journals, of which 12 are in foreign journals and 9 of them are with IF. The applicant's total IF is 18,084.

### **2. Relevance of the topic**

Malaria continues to be one of the leading endemic diseases globally today. According to WHO data, in 2017, there were 219 million cases worldwide, and 435,000 deaths. Bulgaria was certified by the WHO as a malaria-free country in 1965, but there is a potential risk of local transmission restoration due to the existing potential endemicity in much of the country. From April to October, temperature factors are favorable for the development of malaria parasites in anopheline mosquitoes, and population susceptibility is enhanced. Therefore, the dissertation work is significant, relevant and very timely because of the opportunities for travel and work of Bulgarian citizens outside the country and the large number of refugees and migrants residing or passing through Bulgaria.

### **3. Knowledge of the problem**

In the dissertation of Dr. Kaftandjiev, a total of 215 author's titles were included, including in Latin 144 and 71 in Cyrillic, both in Bulgarian and by leading authors from abroad. The PhD student is very knowledgeable about the achievements of world science and practice on the diverse issues of malaria. He quite rightly and scientifically justifies

the state and risks of malaria for our country and precisely defines the purpose and tasks of the thesis.

#### **4. Research methodology**

For the period from 2000 to 2015, 175 cases of imported malaria were investigated, of which 123 were Bulgarian and 52 were foreign nationals. In his research, Dr. Kaftandjiev uses modern epidemiological, analytical and statistical methods, two software programs - SaTScan and FleXScan Software for conducting spatial analysis of malaria cases on the territory of the country and mathematical modeling of malaria transmission using the models of Ross-McDonald and Sh.D.Moshkovsky. The inclusion of this rich assortment of methods objectifies the results obtained and their analysis.

#### **5. Characterization and evaluation of dissertation work and contributions**

The main purpose and tasks of the dissertation are clearly and understandably formulated, scientifically based and feasible. In order to achieve this goal, the author has set himself 6 tasks. Goal content and objectives demonstrate a well-founded approach to conversion.

The scientific results obtained and their discussion in the light of known data in the literature are set out in Sections V and VI of the 121-page dissertation. In an excellent tabular form and figures are given information on the territorial distribution of cases of malaria imported, its dynamics by years, lethality, seasonality and are considered in detail the peculiarities of Bulgarian and foreign citizens.

An important part of the thesis is the malaria transmission parameters. Between 2000 and 2015 Dr. Kaftandjiev found an increase in the average monthly temperature for the country by  $0.537^{\circ}\text{C}$  compared to the period 1916 - 1975. On this basis, he determined with how much shortens the time for mosquito sporogony in the various malaria agents and accordingly is accelerated the possible turnovers. malaria, which would affect the resumption of local transmission, affecting a larger population. The detailed spatial analysis of the cases of imported malaria in the country also proves that a large number of districts with a significant reduction in the time for sporogony and accelerating the rate of malaria transmission fall into the clusters with the highest number of patients with this parasitosis. Using this analysis, these areas have identified at increased risk of recurrent malaria transmission.

I fully endorse the 10 contributions of the dissertation, 3 of which are original scientific and theoretical and 7 applied. In my opinion, a significant scientific contribution has been made: a) the application of the spatial epidemiological analysis method to assess the risk of malaria reintroduction in our country and to identify the most risky territories, and b) to use mathematical models of malaria transmission to develop a prognostic algorithm for the development of the epidemic process and the potential number of people affected by possible malaria recovery in Bulgaria or by sending contingents in malaria-endemic areas.

#### **6. Assessment of publications and personal contribution of the doctoral student**

In connection with his dissertation, Dr. Kaftandjiev has applied 5 publications (2 of them in foreign journals with general IF - 2.522), of which he is the first author in two of them. In addition, he has presented 5 abstracts of papers and posters in scientific forums on the topic, of which three are the first author and one has been exported abroad.

7. **The abstract** is structured in 56 pages, includes all the results of the dissertation and contains a summary in Bulgarian and English.

## **CONCLUSION**

The dissertation contains scientific and applied scientific results, which make an original contribution to science and meet all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the implementation of the ZRASRB and the Rules of the NCIPD.

The dissertation shows that the doctoral student Dr. Iskren Tzvetkov Kafandjiev possesses deep theoretical knowledge and professional skills in the scientific specialty "Parasitology and helminthology", demonstrating qualities and skills for conducting independent research.

Because of the above, I am convinced of my positive appreciation for the award of the Doctoral degree in Doctoral Studies in Parasitology and Helminthology

12/18/2019

Drafted the opinion:



Assoc. Prof. Dr. Iskra Rainova, PhD