

## STATEMENT REPORT

by Assoc. Prof. Diana Toneva, PhD,

Institute of Experimental Morphology, Pathology and Anthropology with Museum,

Bulgarian Academy of Sciences

Internal member of the Scientific jury

appointed according to Order № HO-05-05-6/2.10.2025 of the Director of IEMPAM-BAS

**SUBJECT:** A PhD thesis for the award of the educational and scientific degree “Doctor” in the Scientific specialty „Anthropology” (01.06.01), Professional field 4.3. Biological sciences, Scientific Area 4. Natural sciences, Mathematics and Informatics

**TITLE:** “Main anthropological characteristics and eruption of permanent teeth in children and adolescents aged 5 to 12 years“

**AUTHOR:** Boyan Valentinov Kirilov, MD

### **Biographic data**

Dr. Boyan Kirilov graduated from the Medical University of Sofia in 2019 with a master's degree in Dental Medicine. Since January 1, 2020, he has been enrolled as a full-time PhD student in the Department of Anthropology and anatomy at the Institute of Experimental Morphology, Pathology and Anthropology with Museum, Bulgarian Academy of Sciences. Throughout his doctoral training, Dr. Boyan Kirilov has been actively practicing as a dentist. The PhD student is proficient in English and Russian and possesses good computer skills. He has been a member of the research team on a project funded by the Bulgarian National Science Fund since 2021. During his doctoral program, Dr. Kirilov participated in the preparation of seven scientific publications and took part in six scientific forums held in Bulgaria and abroad. The h-index in Scopus is 1.

### **Brief presentation of the PhD thesis**

The dissertation consists of 134 pages and is illustrated with 28 figures and 25 tables. The bibliography includes 165 references. Dr. Kirilov has submitted a complete set of materials in electronic format, including the PhD thesis, abstract, and all required documents, in accordance



with the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its implementation, and the Regulations on the conditions and procedures for the acquisition of academic degrees and for holding academic positions at the Institute of Experimental Morphology, Pathology and Anthropology with Museum – BAS. Dr. Kirilov has attached five scientific publications related to the topic of the PhD thesis.

### **Relevance of the topic**

The PhD thesis of Dr. Kirilov examines the physical development of children aged 5 to 12 years based on cephalometric characteristics, key somatometric indicators, and the eruption of permanent teeth. The study provides up-to-date information on the rate of growth and development of children within this age range during the period 2020–2023. The sex and age differences in the examined characteristics and processes are analyzed in detail. The lack of up-to-date standards for assessing the eruption of permanent teeth in children and adolescents in Bulgaria highlights the need for such an analysis and for updating the available data. The inclusion of key somatometric indicators, such as height, weight, and body mass index, enables an assessment of the degree of physical development among children during the period of active growth and maturation, and particularly the determination of the prevalence of overweight and obesity. This problem, associated with imbalanced nutritional status among children, has become especially relevant in modern society, which is characterized by increased use of digital devices and reduced physical activity. The significance of the PhD thesis is further determined by the analysis of the impact of nutritional status on the eruption of permanent teeth, as well as by the examination of the relationships between the increase in facial dimensions and tooth eruption in boys and girls aged 5 to 12 years. The PhD thesis also addresses another relevant health issue in childhood — the prevalence of dental caries — highlighting several concerning trends in its frequency and distribution.

### **Aim and tasks of the PhD thesis**

Based on an extensive and detailed literature review, a well-founded and scientifically justified objective has been formulated — to study and characterize the specifics of physical development and the eruption of permanent teeth in children aged 5 to 12 years. To achieve this objective, five clearly defined tasks were set, all of which were fully accomplished during the course of the study.

### **Study sample and methods**

The study was conducted in the city of Sofia and the Sofia region and included 709 children aged between 5 and 12 years. The participants of both sexes (361 boys and 348 girls) were proportionally distributed across the different age groups. The methodological section provides a detailed description of the anthropometric and odontoscopic methods used in the study. The statistical processing of the collected data involves the application of a series of classical statistical methods.



## **Results and discussion**

The results are organized into three main sections: 1. Cephalometric characteristics and indices; 2. Height, body weight, and nutritional status; and 3. Tooth eruption. Each section is well illustrated, presenting the results in both graphical and tabular form. The first section examines the growth trends of the cephalometric characteristics and the changes in cephalometric indices among boys and girls from different age groups, with an assessment of the sex and age differences. The second section traces the changes in height, body weight, and nutritional status of boys and girls aged 5 to 12 years, taking into account the variability and dynamics in the growth of the main somatometric characteristics. The third section is devoted to the eruption of permanent teeth and includes a large set of analyses related to this physiological process. This section presents data on the average age of tooth eruption in boys and girls, as well as standardized charts illustrating tooth eruption by quadrants for each year within the studied age range. It also includes an assessment of the sex differences in the eruption of permanent teeth; an evaluation of the relationship between anthropometric characteristics and tooth eruption; an assessment of the influence of nutritional status on tooth eruption; an analysis of dental caries prevalence among children stratified by sex, age, and place of residence; and an evaluation of the relationship between caries incidence and the children's nutritional status. Each subsection ends with a summarized evaluation of the results and limited references to previous studies. Overall, the PhD thesis lacks an in-depth discussion of the obtained findings, which I consider a shortcoming of the work.

## **Conclusions and contributions of the PhD thesis**

The results of the PhD thesis are summarized in eight conclusions that reflect the essence of the conducted research and the data analysis. The author identifies the periods of most intensive growth in cephalometric and somatometric characteristics in boys and girls, and traces the trends in the redistribution among the categories of facial indices and body mass index with increasing age. The study establishes tendencies indicating earlier tooth eruption in girls compared to boys and in the lower jaw compared to the upper, as well as a greater number of erupted teeth in overweight and obese children compared to their underweight peers. The author emphasizes the statistically significant relationship between the eruption of permanent teeth and facial dimensions, with stronger correlations in girls. Regarding dental caries, the study summarizes a trend of higher caries prevalence among girls, among obese children, and among those living in the Sofia region.

Eight scientific contributions have been formulated: two of original character, four of theoretical character, and two of applied character. The first two groups of contributions highlight the scientific value and significance of the conducted research, while the third group emphasizes the applicability of the obtained results in various fields of clinical practice (pediatric, dental, and orthodontic), as well as in the field of physical anthropology.



### **Abstract of the PhD thesis**

The project of the author's abstract is presented in 52 pages and reflects the essence, structure, and content of the dissertation.

### **CONCLUSION**

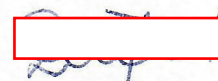
The PhD thesis of Dr. Boyan Kirilov, entitled „Main anthropological characteristics and eruption of permanent teeth in children and adolescents aged 5 to 12 years“, contains significant scientific results that represent an original contribution to science at the national level and provide a valuable basis for international comparative studies on the chronology, dynamics, and characteristics of physical development.

The PhD thesis demonstrates that Dr. Kirilov possesses in-depth knowledge and skills in the scientific specialty and has the necessary competence to conduct independent research. The review of the submitted documents indicates that Dr. Kirilov meets the mandatory requirements for the award of the educational and scientific degree „Doctor” in the professional field 4.3. Biological Sciences, scientific area 4. Natural Sciences, Mathematics, and Informatics, in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its implementation, and the Regulations on the conditions and procedures for the acquisition of academic degrees and for holding academic positions at the Institute of Experimental Morphology, Pathology and Anthropology with Museum – BAS.

Based on the above, I give a positive assessment of the PhD thesis and propose to the members of the scientific jury to award Dr. Boyan Kirilov the educational and scientific degree of „Doctor” in the scientific specialty „Anthropology” (01.06.01).

06.11.2025

Sofia



Assoc. Prof. Diana Toneva