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# S T A T E M E N T

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**Concerning the PhD thesis of Kristina Rashkova Panova for awarding the educational and scientific degree "Doctor" with the topic "Passive acoustic monitoring of birds in beech forests affected to varying degrees by human activity in the professional field 4.3. Biological Sciences, scientific specialty "Ecology and Ecosystem Protection"**

**Scientific Supervisor: Assoc. Prof. Dr. Boris Nikolov, PhD – Institute of Biodiversity and Ecosystem Research, BAS; Scientific Consultant: Prof. Dr. Tsvetan Zlatanov, PhD – Institute of Biodiversity and Ecosystem Research, BAS**

The dissertation is well-structured and is presented as bound publications. It comprises 52 pages and includes seven sections: Introduction, Aim and Objectives, Literature Review, Material and Methods, Results and Discussion (which incorporates two publications), Conclusion, Acknowledgements, and a Reference List.

In recent years, passive acoustic monitoring, the basis of this dissertation, has been increasingly used to assess birds' species richness, abundance and density, especially in remote and hard-to-reach places with rugged terrain. In this regard, using acoustic data, the present dissertation studies the breeding bird communities in three types of beech forests in the Belasitsa Mountains, affected to varying degrees by human activity. A comparison was made between the species richness of the bird communities using four acoustic indices: Acoustic Complexity Index – ACI, Acoustic Diversity Index – ADI, Acoustic Evenness Index – AEI, Bioacoustic Index – BI. It should be noted that data on the species composition of birds in forests dominated by common beech up to 800 meters above sea level exist in the literature, but there are no systematic studies on the avifauna above this altitude in the high mountain belt, which makes the work valuable and relevant. Moreover, an emphasis in the work is the conservation significant species of the Semi-collared Flycatcher (*Ficedula semitorquata*), for which data are very scarce. In addition to the significance of the presented dissertation work is the fact that passive acoustic monitoring is still little applied in Bulgaria. The modern methods used for signal analysis by the doctoral student and the statistical processing of the data show that she has acquired important knowledge and practical skills for studying bird communities,

and the comprehensive introduction is evidence of her good knowledge of the problem. This significantly contributed to obtaining reliable results and convincing conclusions, which highlight the dissertation's contributions. Thus, the research confirms the importance and reliability of passive acoustic monitoring as an effective tool for long-term monitoring of birds in remote and hard-to-reach places, including the rare and conservation significant species of the Semi-collared Flycatcher. Revealing its preferred habitats and key forest features is essential for its conservation. Four acoustic indices (ACI, ADI, AEI and BI) have been validated as indicators of the species richness of birds in beech forests. It is confirmed that old-growth forests support a greater species richness and abundance, which confirms their importance and the need for their conservation. The data obtained from the acoustic monitoring of bird breeding communities in beech forests allow comparison with similar forest ecosystems in other parts of Europe, which is a prerequisite for revealing new aspects of bird ecology and ethology.

The results of the research related to the topic of the doctoral studies are expressed in two articles, both indexed in WoS. One was published in *Acta Zoologica Bulgarica*, and the other was accepted for publication in the specialized ornithological journal *Ardeola: International Journal of Ornithology*. Both publications are co-authored, but Kristina Panova is the first author, which demonstrates her leading role in the research. The doctoral student has also participated with the results of her research in two international forums.

## Conclusion

This dissertation fulfills the requirements of the Act on the Development of Academic Staff in Bulgaria and the IBER Regulations. It presents a pioneering original study in bird ecology and biodiversity, expanding methodologies for researching nesting bird communities in hard-to-reach places through the use of passive acoustic monitoring. Therefore, I strongly recommend that the esteemed Scientific Jury award the educational and scientific degree of “Doctor” to Kristina Rashkova Panova in the professional field 4.3. Biological Sciences, scientific specialty “Ecology and Ecosystem Protection”.

Statement prepared by:

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